

Enhancing Humanity: Co-Creation and the Moral Imagination



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Short Abstract

The prospect of enhancing human characteristics through advancing technologies in genetic engineering, artificial intelligence and nanotechnology is generating interest in academic, commercial and popular spheres. This research focuses on anthropologies of co-creation as a potential theological response to the questions posed by human enhancement. For a theological anthropology to engage in public and cross-disciplinary debates surrounding enhancement concerns, it must first demonstrate scientific and technological literacy and the capacity to incorporate information from these fields. As the strong links between transhumanism and science fiction demonstrate the importance of the imagination for developing, communicating, and evaluating visions of future human being, a theology of co-creation that is able to engage these ideas must also feature a robust account of the imagination in epistemology and the dissemination of knowledge. Philip Hefner's "created co-creator" incorporates scientific insights into a theological anthropology that is generally positive toward the use of technology to enhance nature. Having inherited an overly rational epistemology from his predecessors in the science and religion field, however, Hefner's proposal reflects a deficit of imagination. J. R. R. Tolkien's notion of sub-creation is not as developed as Hefner's theological anthropology, being primarily a literary theory. Given the high value Tolkien accorded to the imagination and the role of narrative in discerning and conveying ultimate truths, however, his work may offer a corrective to Hefner's in this respect. Tolkien's critical stance to technology prevents a fruitful dialogue with human enhancement issues on the basis of his sub-creation proposal alone.

A constructive theological anthropology that unites the strengths of Hefner's and Tolkien's models is sketched out, drawing on contemporary scholarship in metaphor studies, phenomenology and posthuman discourse, with a view to engaging debates surrounding human enhancement.

Long Abstract

Browse the popular non-fiction section in your favourite bookshop, or flick through the features pages of your preferred newspaper, and you are sure to see content envisioning “better humans”, a transformed human existence in some kind of “technofuture”. Through a combination of genetic engineering, robotics, information technology and nanotechnology (GRIN), the popular imagination is captivated by the possibilities of what humans might become. The notion of human enhancement is also attracting interest within academic and commercial circles, with more extreme advocates identifying as “transhumanists” – part of a movement that promotes the enhancement of the human condition through the deployment of advancing technologies.

From a theological perspective, the possibility of enhancing human capabilities with technology raises a number of questions. How does a transhumanist vision of enhanced humanity relate to a Christian hope of eschatological redemption? Will human enhancement transform us into something other than what we were created to be? These are two examples of theological questions surrounding human enhancement technology which are the subject of contemporary scholarship, however the present work concerns another set of questions. What is the relationship between divine creation and human creation? Can human enhancement be considered a legitimate exercise of human creative agency?

This work begins from a place of pragmatism – technology is continually “progressing”, and usually at more rapid rate than the ethical reflection that would ideally accompany it. Considering the role of theological discourse when it comes to

technological assessment, it concedes that a Christian worldview no longer represents the dominant voice in the public sphere (at least in the West), and does not seek to recapture the authority it may have exercised in the past.

Nevertheless, a robust account of theological anthropology in which we can ground reflection on prospective enhancement technologies is important for the church, and for individual believers. The goal of the present work is to sketch out a constructive theological anthropology for this very purpose. A fear-driven response that reflexively rejects all enhancement technologies as “playing God” from the outset is repudiated as unproductive, closing down debate prematurely; instead a more nuanced and open position is sought.

The prospect of enhancing human capacities through technology is introduced in Chapter 1, particularly as it is envisioned in transhumanist literature. The themes of radical life extension, mind “uploading”, mood enhancement and moral enhancement are explored as representative of the types of enhancements envisioned by proponents of transhumanism, or human enhancement more generally. Transhumanist philosophies are varied, with some transhumanists focusing more on avoiding existential risk on a global scale, while others are more concerned with individual quality of life.

Transhumanist visions of the future share some commonalities with Christian expectations. Both hope for an overcoming of present suffering and limitations, and transhumanist literature is pervaded by traditionally religious language such as “gods”, “salvation” and “heaven”. There are, of course, key differences in the agent of redemption: where Christians generally affirm redemption as the work of God, transhumanists instead exalt the human capacity to engineer a transformation of our existence.

The connection between human technological enhancement and science fiction is also of interest. Not only have the visions and aspirations of many technological innovators been inspired by their own reading of science fiction, but many of these professionals have themselves written in the genre. Human enhancement is portrayed

across a wide spectrum in science fiction, from the horrifyingly dystopic to the emphatically positive, and these writings inevitably influence both technological development and the popular imagination. Fiction is a key arena in which we weigh up alternative futures.

Having introduced the notion of human enhancement, its staunchest supporters in the form of transhumanism, and its relationship with science fiction, Chapter 2 turns its attention to Christian responses. Many cry “playing God” at the mention of enhancement technologies, considering them a transgression of the boundary between Creator and creation. This response is briefly considered, however the focus is on theological resources that allow for a more positive engagement with human technological enhancement.

The transhumanist movement can be understood as the latest development in a long history of celebrating human malleability. Renaissance humanist thinkers, such as Giovanni Pico della Mirandola (1463–1494), Giannozzo Manetti (1396–1459), and Marsilio Ficino (1433–1499), extolled the unique creativity of humans among the creation and their capacity to determine their own nature. Francis Bacon (1561–1626), the “father of modern science”, extended the vision of Italian humanists by uniting the idea of dominion over nature with the promise of modern empirical science. The introduction of evolutionary theory after Darwin provided additional resources to this trajectory – human malleability now encompassed the biological nature as well. Chapter 2 sets transhumanist visions of the future in the context of this historical framework of the malleability of human nature.

The technological nature of transhumanist visions necessitates a corresponding engagement with technology and related scientific concerns on the part of theologians who would respond to transhumanism. The imaginative dimension of transhumanism, particularly evident in its relationship with science fiction, also suggests that the imagination ought to receive attention in theological responses to the movement. In particular, the imagination’s role in epistemology and the communication of

knowledge warrants exploration in this context. Theological engagement with human enhancement proposals will also need to promote a robust ethic and vision of human flourishing that can sustain virtue in a technological environment.

Those theologians who have approached technological progress with various degrees of optimism tend towards understandings of humans as co-creators with God. The notion of co-creation also has historical roots (it is often present in the same historical sources that promote human malleability), however recent accounts rely increasingly on scientific arguments as well as theological. Chapter 3 begins an evaluation of co-creation theology as a response to human enhancement with the theological anthropology of Philip Hefner. In his exposition of humans as “created co-creators”, Hefner makes substantial use of philosopher of science Imre Lakatos’ methodology of scientific research programmes. Hefner is not the first theologian to adopt Lakatosian methodology for theological explication – he follows the example of Nancey Murphy. He states his objective to articulate a “scientifically falsifiable” account of human nature, and, using the Lakatosian framework, articulates nine “auxiliary hypotheses” in support of his core claim that humans are co-creators with responsibility for driving the future of all of nature. Measured against contemporary scientific knowledge, the majority of Hefner’s hypotheses in fact make claims that go beyond the bounds of scientifically verifiable or falsifiable facts. This is by no means a shortcoming of Hefner’s project, indeed his proposals are enriched by their extra-scientific content, however he does both theology and science a disservice in claiming that one can be reduced to the other.

Hefner inherits both from Lakatos, and from the theological mentors who interpret Lakatos before him, the inclination to view the acquisition of scientific knowledge as an entirely rational process – the steady march of reason toward external truth. Lakatos’ methodology descends from the pre-World War II logical positivist movement, which sought the restriction of philosophical discourse to empirically discernible statements. Only reason has epistemological value; the

imagination is treated with suspicion.

In support of the imagination's worth, Chapter 4 turns to the role of the imagination as attested in various scientific, philosophical and theological sources. The excesses of Romanticism notwithstanding, there is renewed interest in the imagination's capacity to illuminate truths inaccessible to the senses or abstracted reason. Independent programmes of scholarship are calling greater attention to the role of the imagination in scientific investigation, and to its importance for theological construction. Charles Taylor, for example, speaks of the imagination as leaping ahead and setting the path for more certain knowledge. Peter Medawar has offered an alternative reading of Popperian scientific methodology that gives more credit to the imagination's role in scientific enquiry. This accords with the work of a number of scientists and philosophers of science that emphasise the imaginative character of science.

The suppression of the imagination is characteristic of the entire science and religion field, at least in its earlier years. Attending to the emergence of science and religion as a formal field of study in the 1960s, particularly through the determinative work of Ian Barbour, reveals various epistemological assumptions imported into the field from the beginning. Influenced by the contemporary philosophy of science, Barbour essentially established certain "tram lines" according to which the field has developed, lines which gave heuristic priority to science over theology and prioritised reason over the imagination. Given the origins of the science and religion field, it is unsurprising that many of its second generation scholars such as Hefner, Murphy and Robert Russell have been drawn to the philosophy of Lakatos.

When it comes to accounting for human imagination, the science and religion field has yet to catch up with developments in the separate disciplines of theology and of science. The result of this marginalisation of the imagination for Hefner's project is a diminished sense of limits to human creativity, and a somewhat vague treatment of human discernment. Just as Medawar reinterpreted the work of Popper, however,

so is it possible to read Lakatos (who is indebted to Popper in many ways) in a more imaginative light, although this requires adjustments to his model. This would, in turn, allow room for the imagination's role to be developed in Hefner's co-creation theological anthropology, and reconcile the dissonance between his insistence on articulating theology in empirically falsifiable form and his instinctual awareness of the imagination's importance (he frequently uses poetry to illustrate his thought, and he understands myth according to Paul Ricoeur's hermeneutics). Hefner refers to the imagination as a valuable resource for future thinking about human enhancement, yet does not incorporate it into his own theological construction.

Hefner claims that storytellers and poets will be vital as the world becomes ever more technological. This directs the present enquiry naturally to a storyteller concerned with ideas of co-creation: J. R. R. Tolkien. Tolkien's notion of "sub-creation" is therefore explored as a potential resource in Chapter 5. At present there is only a small amount of secondary literature concerning this aspect of Tolkien's theology;; it has not yet been brought into the conversation surrounding human enhancement. Furthermore, various "corrective" dialogue partners have been proposed with respect to Hefner's "created co-creator" metaphor, however they tend to be located within traditional ethical frameworks (e.g. Paul Ramsey, Joseph Fletcher, Hans Jonas). The introduction of dialogue partners more concerned with the imagination represents a novel move. In particular, Tolkien's understanding that sub-creation must be in accordance with divine norms offers a more robust sense of limits to human creativity, and he affirms the importance of imagination in the discernment of such limits. However, Tolkien is well-known for his critical stance towards technology, thus his understanding of co-creation does not immediately recommend itself for application to human enhancement issues.

The constructive element of this project considers how co-creation theologies might be enriched or corrected by a greater emphasis on the role of imagination, particularly in equipping humans to construct and evaluate alternative future

scenarios. It explores the possibility of a middle way between Hefner and Tolkien. Can the scientifically-grounded notion of human creativity developed in light of real world concerns be united with a more literary approach to human creativity that draws on the imagination to both inspire human action and caution against overstepping limits?

Chapter 6 surveys a number of possible dialogue partners in the areas of metaphor studies, phenomenology and posthumanism, which offer resources for enriching the co-creation theologies already analysed. A synthesis of the relative strengths of Hefner's and Tolkien's understanding of human creativity is located in the interstices of theology, cognitive science and literature studies. A constellation of contemporary discourses are identified within which the proposed approach to human creativity as it impinges on human enhancement debates might operate and flourish.

The concluding chapter provides a preliminary sketch of a more robust understanding of human creativity that can contribute to ongoing discourse surrounding the future of humanity and its technological enhancement. Affirming humans as creators in imitation of and to the glory of our Creator, all the while attending to the narratives that shape our technological imagination and use, we are able to locate the possibilities of human enhancement technology within a responsibility to create carefully, in ways that do not perpetuate inequality or instrumentalise non-human nature. The compelling visions of transhumanism that resonate with so many might be rehabilitated and recalibrated by the acknowledgement that we are not ultimately the agent of redemption, and the future glory in which we hope is not entirely of our own design. As scholarship continues to pursue a more integrated approach to understanding human being and relationship with the non-human world in all its complexity, it will continue refining a theological anthropology that can support ongoing ethical deliberation over how and what we create.

Contents

Acknowledgments	iii
Short Abstract	v
Long Abstract	vii
List of Figures	xix
List of Abbreviations	xxi
Introduction	1
 I Understanding the Challenges	 9
1 Visions of Human Enhancement	11
1.1 What is Transhumanism?	12
1.1.1 Radical Life Extension	14
1.1.2 Hedonic Recalibration	16
1.1.3 Moral Enhancement	17
1.1.4 Mind Uploading	19
1.2 The Novelty of Human Enhancement?	20
1.2.1 Transhumanism as a Religious Narrative	23
1.3 Imagining Prospective Technologies	25
1.3.1 Science Fiction and Technology	25
1.3.2 Science Fiction and Expectations of the Future	33
1.3.3 Human Enhancement in Science Fiction	34
 2 A Theology of Human Enhancement?	 39
2.1 Responding Theologically	40
2.2 “Playing God”	42
2.3 The Relationship between Divine and Human Creativity	45
2.3.1 Understanding Human Creativity	51
2.4 The Scope of Creativity: Technology as a Creative Enterprise	56

2.4.1	Co-Creation and Science	57
2.5	Creativity and Fallenness	61
II	Responding Theologically to Human Enhancement	63
3	Humans as “Created Co-Creators”	65
3.1	The Created Co-Creator in Context	66
3.1.1	The Theological Task	66
3.1.2	The Lakatosian Research Programme	68
3.1.3	The Created Co-Creator Model	73
3.2	Theological Coherency	93
3.2.1	How Lakatosian is the Created Co-Creator Model?	98
3.3	The Created Co-Creator as a Response to Human Enhancement Issues	104
3.3.1	Co-Creation and Technology	104
3.3.2	The Theological Application of the Created Co-Creator to Biotechnological Issues	109
3.3.3	The Limits of Co-Creation	117
3.3.4	The Role of the Imagination for the Created Co-Creator	122
4	Co-Creation and the Imagination	129
4.1	Imagination and Epistemology	130
4.1.1	Defining the Imagination	130
4.1.2	The Romantic Imagination	133
4.1.3	Imagination and Theology	137
4.1.4	Imaginative Science	141
4.1.5	Imagination, Reason and Belief	146
4.2	Why the Imaginative Deficit in Co-Creation Accounts?	149
4.2.1	The Legacy of Rationalism	149
4.2.2	The Development of Science and Religion	153
4.2.3	Theological Heritage	157
4.2.4	Lakatos and Imagination	160
5	Humans as Sub-Creators	165
5.1	Why Tolkien?	166
5.2	Tolkien’s Sub-Creation	167
5.2.1	The Theory of Sub-Creation	167
5.2.2	Sub-Creation in Tolkien’s Narrative	172
5.3	Tolkien’s Sources	176
5.3.1	Theological	176

5.3.2	Philological/Literary	182
5.3.3	Philosophical	187
5.3.4	Personal	189
5.4	Sub-creation and Reality	191
5.4.1	Narrative	198
5.4.2	What Is the Good Life?	207
5.5	Sub-Creation as a Response to Human Enhancement Issues	209
5.6	Tolkien's Sub-creation vs. Hefner's Co-Creation	210
5.7	Tolkien and Technology	212
5.7.1	Theology and the Moral Imagination	219
III	Seeking a Synthesis	223
6	Towards a Constructive Theological Response to Transhumanism	227
6.1	Overcoming Dichotomies of Thought in Co-Creation Theologies	228
6.2	A Vision of Moral Co-Creation	234
	Evolutionary Origins	234
	Centrality of Creativity	235
	Human/Divine Creativity?	238
	Scientific Engagement	239
	Technology is Creative	240
	Story-Telling and Myth-Making	248
	Moral Imagination	251
	Highlighting Embodiment	260
	Challenging Anthropocentrism	264
	Reclaiming Christian Visions	269
	Conclusion	273
	Engineering Sleep: A Test Case	276
	A Productive Approach	278
	Future Directions	281
	Bibliography	285

List of Figures

1.1	“Futurist” illustration by Arthur Radebaugh	29
1.2	Bohn aerospace advertisement by Arthur Radebaugh	29
3.1	Schematic representation of Hefner’s “created co-creator” model . .	98

List of Abbreviations

The major works of Hefner are abbreviated as follows:

THB *Technology and Human Becoming* (2003)

THF *The Human Factor: Evolution, Culture, Religion* (1993)

The major works of Tolkien are abbreviated as follows:

FR *The Fellowship of the Ring* (1966)

LBN *Leaf by Niggle* (2001)

Letters *The Letters of J. R. R. Tolkien* (1981)

LOTR *The Lord of the Rings* (refers to the whole)

OFS *On Fairy-Stories* (2001)

RK *The Return of the King* (1966)

Silmarillion *The Silmarillion* (1977)

TT *The Two Towers* (1966)

Full publication information for each is provided in the bibliography; publication year corresponds to the particular editions consulted.

Introduction

Imagining the Future

For decades, science fiction has captured the imagination concerning our future relationship with technology, and the ways in which it might alter our very nature.¹ The human imagination is captivated by narratives of “technocultures” and human enhancement, despite the often dystopic character of such works. For the most part, these possibilities remained firmly in the domain of fiction. Increasingly, however, advances in genetics, robotics, information and nanotechnologies (GRIN) are bringing the fantasies of sci-fi writers closer to reality. Ethical questions concerning human genetic modification are no longer merely idle speculations, but rather pressing concerns, with the development of CRISPR/Cas9 technology in 2014 rendering precise gene-editing solutions within reach.² IBM supercomputer Deep Blue’s landmark defeat of world chess champion Garry Kasparov in 1997 was superseded by the even more impressive victory of computer program AlphaGo over professional human player Lee Sedol at the complex Chinese strategy board game Go in 2016, injecting new vigour into speculations over the future of artificial intelligence.

Enthusiasm for enhancement technologies reaches its zenith in the transhumanist movement, which advocates for a deliberate programme of human enhancement ranging from radical life extension to cognitive enhancement and even moral enhancement, and is gaining prominence in academic, commercial, and popular spheres. Despite significant technological advances, many transhumanist visions of future human existence *still* read like science fiction e.g. the proposal that we

1. Of course, there are difficulties in defining what precisely human nature is, and what constitutes an alteration of it.

2. Feng Zhang, Yan Wen, and Xiong Guo, “CRISPR/Cas9 for Genome Editing: Progress, Implications and Challenges,” *Human Molecular Genetics* 23 (2014).

may one (not too far off) day scan a human brain and replicate its complete functionality on a silicon substrate.³

The relationship between transhumanism and science fiction bears exploring, however – not only have the visions and aspirations of many technological innovators been inspired by their own reading of science fiction, but many of these professionals have themselves written in the genre. Science fiction as a medium may reflect our understanding of what it means to be human, particularly as it responds to technological possibilities. Take the 2013 film, *Her*, directed by Spike Jonze. We are introduced to lonely Theodore Twombly, who finds friendship and ultimately enters into a romantic relationship with a “female” AI operating system. Without spoiling too much of the plot, the dimension of the film of interest to us here is that Theodore’s humanity is not diminished by this encounter with AI, rather much of his emotional dysfunction is healed through the relationship. Despite her non-biological nature, the operating system is essentially attributed a human identity.

Films like *Her*, and the older *A.I.*, demonstrate that our understanding of what makes us human extends beyond our biological makeup. We are moving toward a more fluid notion of human nature as the boundaries between the natural and artificial are blurred. N. Katherine Hayles contends that we are unavoidably posthuman – our technological dependencies and relationships render us cyborgs.⁴ We have seen a proliferation of neologisms defining our species in terms of its technological nature – *Homo faber* and “technosapien” are two which come to mind.

The challenges of ever-progressing technology and its associated narratives of the future prompt many theological questions. What place does technology have in our understanding of creation, anthropology, soteriology, and eschatology? The Christian church is often perceived as standing in opposition to prospective technological enhancements, with the notion of “playing God” familiar in public discourse. The use of technology to enhance human capabilities is associated with

3. Hans Moravec, *Mind Children: The Future of Robot and Human Intelligence* (Harvard University Press, 1988).

4. N. Katherine Hayles, *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics* (University of Chicago Press, 1999).

the Greek myth of Prometheus, a Titan who stole fire from the gods and gifted it to humanity. For the most part this myth is deployed as a warning against hubris (hence Mary Shelley gave her novel *Frankenstein* the subtitle of *The Modern Prometheus*),⁵ and a reinforcement of the bounds of human creaturehood.

Yet there is a trajectory in Christian thought that can be offset against these objections. Notions of creaturely finitude exist in tension with celebrations of human freedom and creativity. From the Renaissance humanist thinkers who extolled the unique creativity of humans among the creation and their capacity to determine their own nature, to the “Noosphere”, or collective consciousness, that Pierre Teilhard de Chardin imagined humanity is evolving toward, the malleability of human nature and the freedom to alter it have been championed by particular individuals or groups.

Since the time of the Renaissance, the claims for human artistry have grown more audacious, however a biblical exploration suggests that we may properly locate human creativity within an overarching doctrine of creation. Our understanding of creativity is further informed by the field of creativity studies, which generally highlights both novelty and value as important dimensions, and the theological analogies that Jacques Maritain and Dorothy Sayers develop around creativity are important background to the central questions of this research. While the majority of scholarship around human creativity concentrates on the arts for its subject, the chief contention of this project is that *technology* is a legitimate element of human making and therefore may be fruitfully engaged through the lens of human creativity.

Those theologians who have approached technological progress with various degrees of optimism tend towards understandings of humans as co-creators with God. The notion of co-creation also has historical roots, however recent accounts rely increasingly on scientific arguments as well as theological. Philip Hefner’s theological anthropology of the “created co-creator” arguably represents the most sustained attempt at a scientifically-engaged theology of co-creation, understanding humans

5. More positive interpretations of the Promethean myth will be treated briefly in a later chapter.

as products of biocultural evolution with both agency and responsibility for accomplishing God's purposes for the whole creation.⁶ Hefner's model has been formative for various accounts of theological anthropology, particularly as theologians consider the relationship between continuing creation and the eschatological future. Co-creation theologies have been instrumental in exploring the theological implications of emerging technologies that allow us to manipulate both human and non-human nature. Ted Peters, for example, builds on Hefner's understanding of co-creation in his own articulation of future-oriented human freedom.⁷ Ron Cole-Turner highlights the co-creative agency of humans in his cautiously optimistic response to human genetic enhancement.⁸ While neither of these thinkers adopt Hefner's approach entirely or endorse it wholesale, it is clearly an idea that has received some traction in the science and religion field. Despite its high citation frequency, the created co-creator concept (and especially the theological and scientific frameworks which underpin it) has rarely been subjected to a sustained analysis. Many Christian thinkers appear to use Hefner's terminology without critically engaging his ideas, thus a comprehensive evaluation of the original proposal is overdue.

The technological nature of transhumanist visions necessitates a corresponding engagement with technology and related scientific concerns on the part of theologians who would respond to transhumanism, or human enhancement more generally. The imaginative dimension of transhumanism, particularly evident in its relationship with science fiction, also suggests that the imagination ought to receive attention in theological responses to the movement. Michael Burdett, in a recent assessment of the historical and contemporary landscape of the science and religion field, laments the neglect of the imagination in science and religion scholarship.⁹ This study owes its timeliness to a confluence of developments in theology, cognitive science and literary studies. Particular currents of thought in these fields are brought

6. Philip Hefner, *The Human Factor: Evolution, Culture, Religion* (Fortress Press, 1993).

7. Ted Peters, *Playing God? Genetic Determinism and Human Freedom*, 2nd ed. (Routledge, 2003), 125.

8. Ronald Cole-Turner, "Biotechnology and the Religion-Science Discussion," in *The Oxford Handbook of Religion and Science*, ed. Philip Clayton (Oxford University Press, 2008), 942–943.

9. Michael Burdett, "Assessing the Field of Science and Religion: Advice From the Next Generation," *Zygon* 52, no. 3 (2017), 760.

into conversation with theological anthropologies developed in the area of science and religion. Graham Ward describes the imagination as the thread that brings together theology, literature and philosophy. Essential to theology, “exploring the divine is always an exploration of the imagination or that store of images which the imagination stirs into patterns and narratives”.¹⁰ Though often overlooked, the imagination occupies an equally important place in scientific enquiry.

The imagination criterion is supported by an examination of the imagination’s importance as attested in various scientific, philosophical and theological sources. The excesses of Romanticism notwithstanding, there is renewed interest in the imagination’s capacity to illuminate truths inaccessible to the senses or abstracted reason. Independent programmes of scholarship are calling greater attention to the role of the imagination in scientific investigation, and to its importance for theological construction. When it comes to accounting for human imagination, the science and religion field has yet to catch up with developments in the separate disciplines of theology and of science.

Jeanine Thweatt-Bates expresses the hope that theologians might participate in the construction of the “posthuman”.¹¹ This study aims at such participation, offering a much-needed evaluation of existing theological resources for constructive engagement with enhancement technologies, and suggestions for the enrichment of such resources. With renewed attention to the imagination, a scientifically-oriented theology of co-creation might be rehabilitated for a robust contribution to human enhancement discourse.

In exploring a theological anthropology of humans as co-creators with God, this study focuses on epistemological concerns as they intersect with the discernment of appropriate human action. While an epistemological focus identifies pertinent critiques of the theological anthropologies considered here, it has its limitations also. The noetic effects of sin, particularly for the imagination as an emphasis of this

10. Graham Ward, *Unbelievable: Why We Believe and Why We Don't* (I.B. Tauris, 2014), 202–203.

11. Jeanine Thweatt-Bates, *Cyborg Selves: A Theological Anthropology of the Posthuman* (Ashgate Publishing, 2012), 8. A discussion of the terms “posthuman” and “transhuman” is included in chapter one.

study, are only gestured toward, but have clear implications for both discernment and practical application when it comes to humans acting as co-creators. Human activity is grounded within a soteriology that extends far beyond epistemology, and the discussion of co-creation here is situated within an (assumed) orthodox understanding of salvation as effected by God, and not by us.

An exploration of human creativity can easily fall prey to anthropological conceits. In a theological discussion of creation and redemption, our preoccupation with the human experience may cause us to forget that we are located within the broader context of creatureliness. The central questions of this thesis are explored, therefore, within an overarching theological understanding that resists human exceptionalism, a theme that will be considered at the margins of this work.

To make the case for an imaginative, scientifically-informed theology of co-creation, this study is divided into three parts. Part 1 establishes the foundations of the study, introducing the philosophical and theological questions posed by human technological enhancement. A brief survey of representative enhancements envisioned by transhumanists and other enhancement advocates is presented, and their imaginative reach into the public sphere, particularly through the medium of science fiction, is explored (Chapter 1). The tendency toward a negative Christian evaluation of technological enhancement as “playing God” is highlighted, and the relationship between human creativity and divine creation is explored in terms of its biblical foundations, historical development, insights from the field of creativity studies, and the contributions of select theological accounts (Chapter 2). Part 2 introduces the major theological interlocutors for the study. Hefner’s created co-creator model is taken as a starting point, engaging as it does with scientific insights, and is interrogated in terms of the scientific methodology he adopts and the usefulness of his framework for reflecting on human technological enhancement (Chapter 3). Identifying an imaginative deficit in Hefner’s approach, the epistemological importance accorded to the imagination in select scientific and theological discourse is reviewed (Chapter 4). J. R. R. Tolkien’s proposal of humans as “sub-creators” is introduced as an imaginative corrective to Hefner’s approach,

and evaluated for its ability to address technological questions (Chapter 5). Can the scientifically-grounded notion of human creativity developed in light of real world concerns be united with a more literary approach to human creativity that draws on the imagination to both inspire human action and caution against overstepping limits? Part 3 gives an affirmative answer to this question, locating a synthesis and extension of the relative strengths of Hefner's and Tolkien's understanding of human creativity in the interstices of contemporary theology, cognitive science and literature studies. Studies in metaphor, phenomenology and posthumanism are incorporated into a preliminary sketch of a constructive theology of co-creation that can engage with transhumanist visions of a technologically-enhanced humanity. Chapter 6 draws on these additional disciplines in mapping the terrain of an imaginative, scientifically-informed theological anthropology, while the conclusion considers where this approach may be productive and provides a small case study to demonstrate the proposal's application.

Preliminary versions of sections from the third chapter of this work were published as "The Scientific Character of the Created Co-Creator", *Zygon: Journal of Religion and Science* 52 (3), 2017: 726–746; "Are Scientific Research Programmes Applicable to Theology? On Philip Hefner's Use of Lakatos", *Theology and Science* 15 (2), 2017: 188–202; and "Human Uniqueness and Technology: Are We Co-Creators with God?" in *Issues in Science and Theology: Are We Special?*, eds. M. Fuller, D. Evers, A. Runehov and K. Saether (New York: Springer, 2018). Sections from the first and final chapters were published together in "Human Flourishing, Joy, and the Prospect of Radical Life Extension" *The Expository Times* 129 (12), 2018:554–561.

The goal of this study is to deepen our understanding of human creativity from a theological perspective, to resource Christian theology (and more broadly the church) for reflecting on the possibilities for enhancing human capabilities through various (plausible or far-fetched) technologies.

Part I

Understanding the Challenges

*Do not go gentle into that good night
Rage, rage against the dying of the light.*

— Dylan Thomas

*Then the utopian crystal palace will be erected; then...
Well, then, those will be the days of bliss.*

— Fyodor Dostoevsky

1

Visions of Human Enhancement

Contents

1.1 What is Transhumanism?	12
1.1.1 Radical Life Extension	14
1.1.2 Hedonic Recalibration	16
1.1.3 Moral Enhancement	17
1.1.4 Mind Uploading	19
1.2 The Novelty of Human Enhancement?	20
1.2.1 Transhumanism as a Religious Narrative	23
1.3 Imagining Prospective Technologies	25
1.3.1 Science Fiction and Technology	25
1.3.2 Science Fiction and Expectations of the Future	33
1.3.3 Human Enhancement in Science Fiction	34

Chapter Overview

No longer the sole purview of fiction, the prospect of human enhancement through the use of genetic engineering, artificial intelligence and nanotechnology is generating increasing interest in academic and commercial circles. This chapter provides an introduction to transhumanist philosophy, which lies at the extreme end of human technological enhancement advocacy, and surveys radical life extension, hedonic recalibration, moral enhancement and mind uploading as representative types of enhancements envisioned by its proponents. Transhumanist expectations of the

future are compared with certain dimensions of Christian eschatology, highlighting both continuities and dissimilarities. The impact of science fiction in shaping both technological innovation and the popular imagination when it comes to human enhancement technologies is considered, preparing for a more comprehensive treatment of the imagination throughout this work.

1.1 What is Transhumanism?

Transhumanism is a movement that promotes the enhancement of the human condition through the deployment of advancing technologies such as genetic engineering, nanotechnology and artificial intelligence.¹ It seeks the evolution of intelligent life beyond the human, both its form and limitations.² The ultimate vision of transhumanism is complete liberation from the constraints of natural evolution.³

The formal definition of transhumanism provided by Nick Bostrom on behalf of the World Transhumanist Association is:

(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.⁴

Before proceeding, a brief clarification of terms is required. The term “transhumanism” is often used interchangeably with “posthumanism”. “Transhumanism” will generally be used here, as “posthumanism” can also refer to a school of thought that rejects humanism and the Enlightenment emphasis on the individual.⁵ Some

1. Nick Bostrom and Michael Depaul, “Transhumanist Values,” *Journal of Philosophical Research* 30 (2005), 3.

2. Anders Sandberg, “Transhumanism and the Meaning of Life,” in *Religion and Transhumanism: The Unknown Future of Human Enhancement*, ed. Calvin Mercer and Tracy Trothen (Praeger Publishers, 2015), 3.

3. *ibid.*, 9.

4. Nick Bostrom, “The Transhumanist FAQ: A General Introduction (Version 2.1),” *World Transhumanist Association*, 2003, <http://www.nickbostrom.com/views/transhumanist.pdf>, 4.

5. Stuart Sim, “Posthumanism,” in *The Routledge Companion to Postmodernism*, ed. Stuart Sim (Routledge, 2012). The work will still draw upon resources that use the term “posthumanism” in

have also sought to distinguish between “transhumans” i.e. “transitional humans” as a description of the intermediate state in the process of becoming “posthuman”, the end goal.⁶ Kristi Scott offers a helpful analysis of the differences between the two terms, arguing that posthumanism “rejects anthropocentrism and instead understands humans as a social and cultural construct.”⁷ This research acknowledges the importance of posthuman discourse,⁸ but focuses more on transhumanist thought while raising theological questions concerning human enhancement.

It must also be pointed out that there are multiple versions of transhumanism. Anders Sandberg, to give one example, highlights three separate strands of transhumanism, aiming variously for the enhancement of the individual, the betterment of humanity, or the achievement of life potential for the universe.⁹ Accepting that the movement consist of varying strands, this work will focus on several major themes within transhumanism as they are advanced by representative thinkers. The specific technologies involved are less relevant here as the emphasis is on the various ways in which the future of humanity is envisioned.

Furthermore, transhumanism is not only concerned with the technological enhancement of the human person, but is bound up in a greater vision for the transformation of human society.¹⁰ James Hughes, bioethicist and transhumanist, contends that “we cannot imagine the grandeur of transhuman civilisation”, in much the same way that the present civilisation transcends that of our Paleolithic ancestors.¹¹ Hughes’ affirmation of the transhumanist approach is driven by both

an equivalent sense to “transhumanism”. For example, Brent Waters uses the term “posthumanism” in speaking about technological enhancement of human being (Brent Waters, *From Human to Posthuman: Christian Theology and Technology in a Postmodern World* (Ashgate Publishing, 2006)).

6. World Transhumanist Association, “Transhumanist FAQ,” 2015, <http://humanityplus.org/philosophy/transhumanist-faq/>.

7. Kristi Scott, “Transhumanism vs. /and Posthumanism,” *Institute for Ethics and Emerging Technologies*, July 14, 2011, <https://ieet.org/index.php/IEET2/more/scott20110714>.

8. Posthumanism will be examined in the final chapter as a resource for theological anthropology.

9. Sandberg, “Transhumanism and the Meaning of Life”, 4.

10. Stephen Garner, “Christian Theology and Transhumanism: The “Created Co-Creator” and Bioethical Principles,” in *Religion and Transhumanism: The Unknown Future of Human Enhancement*, ed. Calvin Mercer and Tracy Trothen (Praeger Publishers, 2015), 229.

11. James Hughes, “The Big Questions: What Comes After Homo Sapiens?,” 15 November 2006, 70–72, <https://www.newscientist.com/article/mg19225780-076-the-big-questions-what-comes-after-homo-sapiens/>, 71.

positive and negative motivations. On the one hand, fear of becoming the “ensnared victims” of the “exponentially growing web of machines” requires us to embrace transhumanism and remain ahead of the “singularity”.¹² On the other hand, transhumanism represents the Enlightenment’s positive vision at its zenith, the means by which we might create once and for all a “single tolerant democratic society”.¹³ For transhumanists, human enhancement is the route to a good life, a notion that will be explored further in a later chapter.

Acknowledging that transhumanism as a philosophy considers the technological enhancement of human characteristics in a holistic sense, some particular aspects of human enhancement will be examined as examples: hedonic recalibration, radical life extension, mind uploading, and moral enhancement. With the exception of mind-uploading, perhaps, these enhancements may be endorsed to varying degrees by those who may not identify as transhumanist – transhumanism simply sits at the extreme end of advocacy for employing technology in aid of human enhancement. The examples given are by no means exhaustive – a range of cognitive and physical enhancements proposed and envisioned would fall outside of the categories represented. Additionally, the focus in this study is not on particular technologies, or even particular enhancements for the most part; what follows is merely a brief survey of what enhancement might entail before the questions are treated in a more general sense.

1.1.1 Radical Life Extension

“I don’t want to achieve immortality through my work. I want to achieve it through not dying.”¹⁴ We may laugh at Woody Allen’s words, but humanity as a whole has sought immortality as far back as we can ascertain through literature. From at least the time of the ancient Sumerian *Epic of Gilgamesh* onward, ideas of immortality have captivated the human imagination.

12. Hughes, “The Big Questions: What Comes After Homo Sapiens?”, 71.

13. *ibid.*, 71.

14. Linda Sunshine, ed., *The Illustrated Woody Allen Reader* (Alfred A. Knopf, 1993), 250.

Radical life extension is a growing area of research (and funding).¹⁵ Transhumanist Aubrey de Grey and colleagues envision what they term “engineered negligible senescence”, proposing to prevent ageing by targeting the various biomolecular processes associated with progressive loss of vitality on an individual basis.¹⁶ For example, they suggest that a combination of gene therapy, exercise and growth factor supplementation can counter various kinds of age-related cell loss, while genetically engineered muscle might negate a decline in hormone secretion.¹⁷ The logic of the philosophical Ship of Theseus is applied (as the ship voyaged, each plank was replaced one at a time so that the ship was perpetually replenished) to biological cells.¹⁸ Life extension in an enhancement context is not merely a lengthened life (which could include prolonged senescence), but a slowing down or reversal of the ageing process that also effects an increase in health and quality of life.¹⁹

Grey hopes to reach “longevity escape velocity” (or “actuarial escape velocity”), living long enough to benefit from rejuvenation therapies and thus stay ahead of the ageing curve.²⁰ He calls for policy measures that will prioritise such research, highlighting the elimination of retirement benefits as an economic incentive, and considers thousand-year lifespans to be attainable.²¹

Bostrom represents death in fable form as an evil tyrant of a dragon, which must be killed.²² Of course, a negative view of death alone does not equal transhumanism, except where combined with advocacy for radical life extension. Michael Hauskeller

15. For one example of serious engagement with anti-ageing research, see Google’s company Calico: <https://www.calicolabs.com/>

16. For a summary of de Grey and colleagues’ proposal for “engineering negligible senescence” see Aubrey de Grey et al., “Time to Talk SENS: Critiquing the Immutability of Human Aging,” *Annals of the New York Academy of Sciences* 959 (2002).

17. *ibid.*, 456.

18. Larry Temkin, “Is Living Longer Living Better?,” in *Enhancing Human Capacities*, ed. Julian Savulescu, Ruud ter Meulen, and Guy Kahane (Wiley-Blackwell, 2011), 352.

19. Gaia Barazzetti and Massimo Reichlin, “Life Extension and Personal Identity,” in *Enhancing Human Capacities*, ed. Julian Savulescu, Ruud ter Meulen, and Guy Kahane (Wiley-Blackwell, 2011), 398.

20. Aubrey de Grey, “Escape Velocity: Why the Prospect of Extreme Human Life Extension Matters Now,” *PLOS Biology* 2, nos. 723-726 (2004).

21. *ibid.*.

22. Nick Bostrom, “The Fable of the Dragon Tyrant,” *Journal of Medical Ethics* 31 (2005).

makes the valid point that a wish to avoid death can be held simultaneously with a reluctance to live forever, even if both desires cannot be achieved together.²³

1.1.2 Hedonic Recalibration

Another dimension of human enhancement to consider is the notion of “hedonic recalibration”. David Pearce describes this in conjunction with his “abolitionist project” – the eradication of sentient suffering according to the “hedonistic imperative”. Pearce argues that pain and suffering can be removed from our experience entirely through pharmaceutical and genetic intervention, and thus promotes an abolitionist project seeking the annihilation of pain in all sentient life (beginning with humans).²⁴ Pearce terms his online manifesto to abolish suffering “The Hedonist Imperative”, revealing some of the philosophical underpinnings of the project. In this vision of enhanced human life well-being is genetically programmed.²⁵

Though largely in agreement with Pearce, Bostrom emphasises a more positive concept of the good life i.e. a life that is not only marked by the absence of suffering, but by an abundance of “good” feelings. He offers the following appeal in favour of increasing both the quality and length of life:

Have you ever been so happy that you felt like melting into tears? Has there been a moment in your life of such depth and sublimity that the rest of existence seemed like dull, gray slumber from which you had only just woken up? It is so easy to forget how good things can be when they are at their best. But on those occasions when we do remember – whether it comes from the total fulfillment of being immersed in creative work or from the tender ecstasy of reciprocated love – then we realize just how valuable every single minute of existence can be, when it is this good. And you might have thought to yourself, “It ought to be like this always. Why can’t this last forever?”

Well, maybe – just maybe – it could.²⁶

We might ask how the engineering of positive affect envisioned here connects with a deeper sense of meaning or purpose. Sandberg describes efforts to construct and

23. Michael Hauskeller, *Better Humans? Understanding the Enhancement Project* (Routledge, 2013), 90.

24. David Pearce, “The Abolitionist Project,” 2007, <http://www.abolitionist.com/>.

25. Bostrom, “The Transhumanist FAQ”, 44.

26. *ibid.*, 34.

articulate “pure transhumanist concepts of meaning”.²⁷ The notion of extropianism was developed and disseminated by the Extropy Institute in the early 1990s – an institution that has shaped much of contemporary transhumanism. Transhumanist advocate Max More uses “meaning” in a psychological sense (as opposed to teleological or ethical) in his claim that extropianism provides “an inspiring and uplifting meaning and direction to our lives, while remaining flexible and firmly founded in science, reason, and the boundless search for improvement”.²⁸

Mood enhancement is presented as a characteristic of existing technologies by Greg Wadler, who investigates the ways in which digital technologies are used to improve mood.²⁹ He argues that emerging technologies such as wearable devices that induce transcranial direct current stimulation operate in similar ways to many pharmaceutical mood interventions and represent an alternative option for regulating and enhancing mood.³⁰

1.1.3 Moral Enhancement

Others would identify human morality as a target for enhancement through technology. Defining moral enhancement is especially tricky; Harris Wiseman offers a working rendition of moral enhancement as “some technological or pharmacological means of affecting the biological aspects of moral functioning, to boost what is desirable, or remove what is problematic.”³¹ Aimed generally at the psychological and affective functioning of people, moral enhancement shares much in common with the mood enhancement proposals discussed in the previous section.

Ingmar Persson and Julian Savulescu call for the use of biomedical means of moral enhancement, focusing especially on the development and application

27. Sandberg, “Transhumanism and the Meaning of Life”, 6.

28. Max More, “The Extropian Principles 2.5,” *Extropy* 11 (1993); Sandberg, “Transhumanism and the Meaning of Life”, 7. Extropianism is More’s preferred term for transhumanism.

29. Greg Wadley, “Mood-Enhancing Technology,” in *Proceedings of the 28th Australian Conference on Computer-Human Interaction* (ACM, 2016).

30. *ibid.*, 327.

31. Harris Wiseman, *The Myth of the Moral Brain: The Limits of Moral Enhancement* (The MIT Press, 2016), 6.

of psychopharmaceuticals to this end.³² As traditional approaches to moral education have had only limited success, argue Savulescu and Persson, global environmental catastrophe can only be avoided through biomedical means of moral enhancement.³³ Essentially, they argue that the human psychology and morality that has developed through evolutionary pressures is no longer fit for purpose in the advanced technological and populous societies most people inhabit today.³⁴ Moral enhancement is not merely desirable, in this view, but imperative to keep up with the likely effects of cognitive enhancement.³⁵ Through drug treatment and genetic engineering, we might speed up the “motivational internalisation of moral doctrines”.³⁶ Increasing oxytocin levels, for example, may increase trust and other pro-social behaviours.³⁷ Similarly, increasing serotonin levels through the use of selective serotonin reuptake inhibitors (SSRIs) can reduce aggression and increase cooperation.³⁸ More generally, moral enhancement should target dispositions related to altruism and justice.³⁹ Robin Hanson makes a related argument that we should use (unspecified) brain augmentation techniques to increase transparency, reduce self-deception, and thus encourage a “truth-orientation”.⁴⁰

As a natural extension of the imperative to enhance our own moral sensibility, Savulescu further contends that we should harness our growing ability to manipulate human genes in order to deliberately engineer “ethically better children”.⁴¹ Again,

32. Ingmar Persson and Julian Savulescu, “Unfit for the Future? Human Nature, Scientific Progress, and the Need for Moral Enhancement,” in *Enhancing Human Capacities*, ed. Julian Savulescu, Ruud ter Meulen, and Guy Kahane (Wiley-Blackwell, 2011), 498.

33. Ingmar Persson and Julian Savulescu, *Unfit for the Future: The Need for Moral Enhancement* (Oxford University Press, 2012), 9–10.

34. Persson and Savulescu, “Unfit for the Future?”, 486.

35. Ingmar Persson and Julian Savulescu, “The Perils of Cognitive Enhancement and the Urgent Imperative to Enhance the Moral Character of Humanity,” *Journal of Applied Philosophy* 25, no. 3 (2008). Note that they interpret cognitive enhancement loosely to include the use of external aids such as supercomputers.

36. Persson and Savulescu, *Unfit for the Future*, 107.

37. *ibid.*, 119.

38. Persson and Savulescu, “Unfit for the Future?”, 499.

39. Persson and Savulescu, “The Perils of Cognitive Enhancement”, 169.

40. Robin Hanson, “Enhancing Our Truth Orientation,” in *Human Enhancement*, ed. Nick Bostrom and Julian Savulescu (Oxford University Press, 2009).

41. Julian Savulescu, “The Maverick: “It’s Our Duty to Have Designer Babies”,” 21 August 2012, <http://www.readersdigest.co.uk/magazine/readers-digest-main/themaverick-its-our-duty-to-have-designer-babies,%20http://www.readersdigest.co.uk/magazine/readers-digest-main/themaverick-its-our-duty-to-have-designer-babies>; c.f. Julian Savulescu,

this is motivated by a somewhat utilitarian argument in support of future generations. For the most part, proposals for moral enhancement are tentative in nature, acknowledging the intricate relationships between positive and negative emotions and the difficulty of achieving specific enhancements. Moral enhancement is recognised as a fraught subject; the judging of what is “moral” is complicated, however advocates contend that the technological engineering of greater morality is a worthy pursuit both on account of the challenges before humanity and the positive outcomes that could be realised.

1.1.4 Mind Uploading

At the more radical end of transhumanist proposals is the notion of “mind-uploading”. Hans Moravec, former director of robotics at Carnegie-Mellon University and developer of advanced robots for both NASA and the military, was the first scientist to popularise the idea of living perpetually via a digital substrate. In his 1988 work *Mind Children*, he envisioned a procedure in which the entirety of the information encoded within the neurons of a human brain could be read, copied and uploaded to a computer.⁴² Rather than a radical extension of biological life, this approach seeks immortality through software existence.

Moravec captures the prevailing attitude toward the body taken by proponents of mind uploading. He defines human being as

The *pattern* and the *process* going on in my head and body, not the machinery supporting that process. If the process is preserved, I am preserved. The rest is mere jelly.⁴³

This vision relies on a material understanding of the self, thus allowing replication on a computer model, and it is common for “uploaders” to use the language of information technology in describing the human brain.⁴⁴

“Procreative Beneficence: Why We Should Select the Best Children,” *Bioethics* 15 (2001).

42. Moravec, *Mind Children*, 109.

43. *ibid.*, 117.

44. See for example Ralph Merkle, “Uploading: Transferring Consciousness from Brain to Computer,” *Extropy: The Journal of Transhumanist Thought* 11 (1993).

Kurzweil considers mind uploading to be a likely scenario, picturing a point in the future at which “we will have effectively uploaded ourselves, albeit gradually, never quite noticing the transfer.”⁴⁵ Apart from increased longevity, mind uploading also pursues the goal of greater intelligence through escaping the limitations of the biological, degenerating brain. Personal identity and memories can be “backed up”, and the uploaded mind would benefit from running on a more efficient “compiler”.⁴⁶

This is only a brief foray into the types of technological enhancements envisioned, which cover lifespan, happiness, morality and intelligence. While there are specific discourses, including critique, surrounding each particular type of enhancement, this project is concerned not with ethics at a casuistry level, but rather with the general project of enhancing human characteristics with technology, and its theological import. Additionally, human enhancement is not necessarily given a blanket endorsement by its proponents but is nuanced in the support it receives; Savulescu and Persson, for example, argue quite strongly against research into increased longevity in their advocacy of moral bioenhancement.⁴⁷ Bostrom and Hughes both focus more on the motivating effect of various existential risks in their own arguments for a transhumanist position; while generally positive toward human enhancement their approbation of particular augmentations is less clear.

1.2 The Novelty of Human Enhancement?

Many of the objections levelled at enhancement technologies frame them as a new and unprecedented threat in human history, requiring urgent action. Leon Kass describes the biotechnological revolution as “not the old crude power to kill the creature made in God’s image, but the new science-based power to remake him

45. Ray Kurzweil, *The Singularity Is Near: When Humans Transcend Biology* (Penguin Books, 2005), 202.

46. Randal Koene, “Uploading to Substrate-Independent Minds,” in *The Transhumanist Reader: Classical and Contemporary Essays on the Science, Technology, and Philosophy of the Human Future*, ed. Max More and Natasha Vita-Moore (Wiley & Sons, 2013), 147–148.

47. Persson and Savulescu, *Unfit for the Future*, 131.

after our own fantasies”.⁴⁸ Just how novel are these transhumanist visions of the future? Gerhold Becker similarly asks:

Has biotech just opened a new chapter in the long history of the scientific conquest of nature, or has it effectively closed the old volume and begun to write the first lines of an entirely different story?... Can we utilize its potential and carry on with our familiar worldviews and religious interpretations of the world, or is biotechnology in itself some sort of new ideology which challenges our traditional place in nature? Is it endowing us with the creative powers of God, or rather reducing us and the mystery of life to mere genetic components at the molecular level?⁴⁹

Peter Medawar, in his essay *The Genetic Improvement of Man*, contends that the notion of improving humanity in some way “must be pretty well coeval with human speculative thought”.⁵⁰ He distinguishes three major categories of future visions when it comes to human improvement: Olympian, Arcadian and Utopian. The Olympian vision holds that humans can become like gods, achieving moral perfection through spiritual insight and discipline. Olympians direct their improving gaze upwards or inwards, according to Medawar. The Arcadian, however, directs their gaze back in time, toward an ancient Golden Age. Improvement takes the form of a natural innocence, where progress is eschewed and peace is the goal. The Utopian looks neither inwards or backwards in their quest for improvement but always forwards, believing that human improvement comes through mastery of the physical environment and new creation.⁵¹ Speaking of utopia in a more general sense, Mark Coeckelbergh argues instead that utopian thinking often looks backward and forward at the same time in its vision of an alternative society.⁵²

Bostrom acknowledges the historical continuity of the transhumanist movement as well, describing it as a progression from early myths of immortality such as the

48. Leon Kass, “Ageless Bodies, Happy Souls: Biotechnology and the Pursuit of Perfection,” *The New Atlantis* 1 (2003), 10.

49. Gerhold Becker, “Biotechnology - The New Ethical Frontier,” in *Changing Nature’s Course: The Ethical Challenge of Biotechnology*, ed. Gerhold Becker (Hong Kong University Press, 1996), 5.

50. P. B. Medawar, “The Genetic Improvement of Man,” in *The Hope of Progress* (Methuen & Co., 1972), 69.

51. *ibid.*, 69–70.

52. He gives the example of William Morris’ *News from Nowhere* (Mark Coeckelbergh, *New Romantic Cyborgs: Romanticism, Information Technology, and the End of the Machine* (The MIT Press, 2017), 58).

Epic of Gilgamesh.⁵³ He traces the roots of transhumanism to the “rational humanism” arising from the convergence of Renaissance humanism with Enlightenment scientific and critical reasoning.⁵⁴ We might, therefore, locate transhumanism as the latest instalment of a historical trajectory that emphasises a human dominion over nature, as well as the malleability of human nature, and the freedom and responsibility of humans to improve their capabilities. Renaissance humanist thinkers extolled the unique creativity of humans among the creation and their capacity to determine their own nature. Francis Bacon, the “father of modern science”, extended the vision of Italian humanists by uniting the idea of dominion over nature with the promise of modern empirical science. The introduction of evolutionary theory after Darwin provided additional resources to this trajectory – human malleability now encompassed the biological nature as well.

We need to consider the claims, promises, and fears associated with transhumanism within this larger history that has understood human nature to be malleable and sought to improve it. As Medawar reminds us, before the transhumanism of today properly emerged it has long been within our means to influence human biological nature on a large scale through selective breeding and culling, and there are plenty of non-scientific means of corrupting human moral nature. Similarly, technology has been bound up in human evolution in various degrees. Medawar suggests that the “proxy evolution of humans beings through exosomatic instruments has contributed more to our biological success than the conventional evolution of our own, or endosomatic, organs”.⁵⁵ We may be alarmed at the greater risk posed by more recent scientific advances, but they are by no means entirely new.⁵⁶

53. Nick Bostrom, “A History of Transhumanist Thought,” *Journal of Evolution and Technology* 14, no. 1 (2005), 1–4.

54. Bostrom, “The Transhumanist FAQ”, 39–40.

55. P. B. Medawar, “Technology and Evolution,” in *Pluto’s Republic* (Oxford University Press, 1982), 185.

56. P. B. Medawar, “Science and the Sanctity of Life,” in *The Hope of Progress* (Methuen & Co., 1972), 87–88.

1.2.1 Transhumanism as a Religious Narrative

On the surface, transhumanism appears to represent the height of a “scientistic” confidence in human capabilities, the “progress” narrative taken to its ultimate conclusion. Yet in many respects, transhumanist expectations for the future resemble religious ones. Ron Cole-Turner provides an interesting comparison of the visions held by some transhumanists, specifically with respect to the technological singularity, with the apocalyptic future described by several popular evangelical Christians.⁵⁷ Robert Geraci agrees, arguing that “the sacred categories of Jewish and Christian apocalyptic traditions have thoroughly penetrated the futuristic musings of important researchers in robotics and artificial intelligence”.⁵⁸

The resemblance between Christian eschatology and transhumanism must not be overstated, however. Superficially, the respective futures in which transhumanists and Christians place their hope share some similarities – immortality, a removal of suffering, etc. Christians and transhumanists generally share the expectation that the future will differ markedly from the present.⁵⁹ Cole-Turner reminds us of some key differences between the two worldviews, however. While technology is credited with achieving human transcendence in transhumanist thought, for Christians this transformation can only be brought about through the work of divine grace.⁶⁰ Furthermore, technology’s promise of control over the self may be set against religion’s requirement to surrender the self.⁶¹

Brent Waters summarises this adjusted understanding of transhumanism well:

The prospect of becoming posthuman is *not* a profane, postmodern alternative to a modern paradigm, mired and encumbered by primitive and un-exorcized religious beliefs. Rather, posthuman discourse represents idiosyncratic religious sentiments that have been forged in postmodern and historicist rhetoric which retains, albeit in a highly eclectic structure, a providential

57. Ronald Cole-Turner, “The Singularity and the Rapture: Transhumanist and Popular Christian Views of the Future,” *Zygon* 47, no. 4 (2012).

58. Robert Geraci, *Apocalyptic AI: Visions of Heaven in Robotics, Artificial Intelligence, and Virtual Reality* (Oxford University Press, 2010), 7.

59. Cole-Turner, “The Singularity and the Rapture”, 792.

60. Ronald Cole-Turner, “Going beyond the Human: Christians and Other Transhumanists,” *Theology and Science* 13, no. 2 (2015), 154–155.

61. Cole-Turner, “Biotechnology”, 941.

and progressive grammar. Posthumanism is *not* a postmodern alternative to lingering religious beliefs, but is itself a contending postmodern religion.⁶²

Bostrom contends, nevertheless, that transhumanism is able to serve some of the same functions that have traditionally been fulfilled by religion: offering a greater vision and a sense of purpose.⁶³ Transhumanists reject supernaturalism and “irreducible spiritual phenomena”, however, as they “prefer to derive their understanding of the world from rational modes of enquiry”.⁶⁴ Former evangelical Christian Meghan O’Gieblyn lends weight to the understanding of transhumanism as a religious substitute, recounting her own disillusionment with Christian faith and discovery of transhumanist philosophy as a satisfying alternative.

Transhumanism offered a vision of redemption without the thorny problems of divine justice. It was an evolutionary approach to eschatology, one in which humanity took it upon itself to bring about the final glorification of the body and could not be blamed if the path to redemption was messy or inefficient.⁶⁵

As we shall see, thinking of transhumanism in religious terms is helpful in formulating a Christian response to the challenges presented by the movement. We would do well, however, to heed Thweatt-Bates’ warning against drawing parallels too quickly between transhumanism and religion, without taking the former on its own terms, as this is likely to prematurely forestall dialogue.⁶⁶ As such, the relationship between human enhancement and the popular imagination is considered next, before looking at the more particular ways in which Christian theology has responded to these prospective enhancements.

62. Waters, *From Human to Posthuman*, 79.

63. Bostrom, “The Transhumanist FAQ”, 46.

64. *ibid.*, 46.

65. Meghan O’Gieblyn, “God in the Machine: My Strange Journey into Transhumanism,” *The Guardian*, 18 April 2017, <https://www.theguardian.com/technology/2017/apr/18/god-in-the-machine-my-strange-journey-into-transhumanism>.

66. Thweatt-Bates, *Cyborg Selves*, 61.

1.3 Imagining Prospective Technologies

1.3.1 Science Fiction and Technology

For many, narratives of “technocultures” and human enhancement are reminiscent of science fiction, and often dismissed for this reason. The relationship between transhumanism and science fiction is worth exploring, however – not only have the visions and aspirations of many technological innovators been inspired by their own reading of science fiction, but many of these professionals have themselves written in the genre.

Let us begin with an attempt to define science fiction. A good starting point is Kingsley Amis’ description:

Science fiction is that class of prose narrative treating of a situation that could not arise in the world we know, but which is hypothesised on the basis of some innovation in science or technology, or pseudo-science or pseudo-technology, whether human or extra-terrestrial in origin.⁶⁷

As J. M. Van der Laan points out, however, much of science fiction deals with science and technology scenarios that *could* plausibly arise, or are visible on the horizon. He points to the example of Ray Bradbury, who was in the process of imagining the “seashells” (thimble-sized radios) that one of his characters places in her ears to listen to audio in *Fahrenheit 451*, only to see a passerby wearing earbuds (a technology which he had not yet encountered).⁶⁸ This is an example of science fiction “dramatiz[ing] for us how the present has already been invaded by the future”.⁶⁹ Margaret Atwood distinguishes between science fiction proper and speculative fiction, arguing that the former “denotes books with things in them we can’t yet do or begin to do, talking beings we can never meet, and places we can’t go”, while the latter “employs the means already more or less to hand, and takes

67. Kingsley Amis, *New Maps of Hell: A Survey of Science Fiction* (Arno Press, 1975), 18.

68. J.M. van der Laan, “Editor’s Notes: Science, Technology, and Science Fiction,” *Bulletin of Science, Technology & Society* 30, no. 4 (2010), 234. Van der Laan actually draws this example from Amis, *New Maps of Hell*, 112.

69. Veronica Hollinger, “Science Fiction and Postmodernism,” in *A Companion to Science Fiction*, ed. D. Seed (Blackwell, 2005), 246.

place on Planet Earth”.⁷⁰ A more general definition is offered in *The Encyclopedia of Science Fiction*: “SF [science fiction] proper requires a consciousness of the scientific outlook, and it probably also requires a sense of the possibilities of change, whether social or technological”.⁷¹ The diversity of science fiction literature renders a more precise definition unlikely, and this serves as a guiding demarcation for the genre. A broader approach to the category of speculative fiction is pursued here, rather than attending to the finer distinctions of genre.

Examining the purposes and functions of science fiction is more fruitful than attempting to define it. In his comprehensive *History of Science Fiction*, Adam Roberts labels the majority of science fiction written in the nineteenth and twentieth centuries as “extrapolated technology fiction”.⁷² Well-known science fiction writer Ursula Le Guin explains the role of science fiction in contemplating possible futures. “The future is a safe, sterile laboratory for trying out ideas in, a means of thinking about reality”.⁷³ Samuel R. Delaney offers a similar view, arguing that science fiction “is training for thinking about the actual changes – sometimes catastrophic, often confusing – that the real world funnels at us year after year”.⁷⁴ Fantasy author Neil Gaiman sums up the capacity of science fiction to explore future possibility:

There are three phrases that make possible the world of writing about the world of not-yet ... And they are simple phrases. ‘What if ...?’ ‘If only ...’ ‘If this goes on ...’⁷⁵

Jacques Ellul, philosopher and critic of technology, reflects an alternative view of science fiction, contending that it actually serves as an adaptation mechanism,

70. Margaret Atwood, “*The Handmaid’s Tale* and *Oryx and Crake* in Context,” *PMLA: Publications of the Modern Language Association of America* 119, no. 3 (2004), 513.

71. Brian Stableford, John Clute, and Peter Nicholls, “History of SF,” in *The Encyclopedia of Science Fiction* (St. Martin’s Press, 1993), 567.

72. Adam Roberts, *The History of Science Fiction* (Palgrave Macmillan, 2007), 4.

73. As quoted in Eileen Gunn, “How America’s Leading Science Fiction Authors Are Shaping Your Future,” *Smithsonian Magazine*, May 2014, <http://www.smithsonianmag.com/arts-culture/how-americas-leading-science-fiction-authors-are-shaping-your-future-180951169/>.

74. As quoted in *ibid.*

75. Gaiman, in introduction to Ray Bradbury, *Fahrenheit 451* (Simon & Schuster Paperbacks, 2013), xi.

portraying extreme and unacceptable uses of technology to foster complacency with the current state of technology.⁷⁶

Since technology is nothing like what it has been shown to be, it strikes us as perfectly acceptable and reassuring. We take refuge in the real technological society in order to escape the fiction that was presented as the true technology.⁷⁷

While Ellul's concerns over the adjustment and compensation effects of science fiction may be an unintended by-product of the genre (he does not consider this a deliberate intention of sci-fi creators),⁷⁸ it is apparent that science fiction is written for a range of purposes, from pure escapist entertainment to serious speculation over aspects of the technological future.

Science fiction inspires and influences many technologists, this connection is well-attested.⁷⁹ Reportedly, the invention of the mobile phone in the 1970s was inspired by the handheld communication devices in the original *Star Trek* series.⁸⁰ Geoffrey Landis is a prolific science fiction writer who also works as a scientist for NASA. Similarly, Charles Sheffield also wrote a large corpus of science fiction alongside his significant position as Chief Scientist for a satellite data processing company that consulted for NASA. Arthur C. Clarke, perhaps best known for his *2001: A Space Odyssey* novel, was a mathematician and physicist who proposed a method of conducting telecommunications relays via geostationary satellites – so important for the field that the geosynchronous orbit around the equator is

76. Jacques Ellul, *The Technological System*, trans. J. Neugroschel (Continuum, 1980), 112.

77. *ibid.*, 112. Richard Stivers picks up on Ellul's point, reading much of contemporary science fiction as compensating for bleak reality, even as he highlights important exceptions such as Aldous Huxley's *Brave New World* (Richard Stivers, "Our Brave New World Today," *Bulletin of Science, Technology & Society* 30, no. 4 (2010), 251).

78. Van der Laan also offers the corrective that this may be true of *bad* science fiction, and, even more so, of bad science fiction uncritically read or viewed. Well-crafted science fiction can encourage critical reflection, creating "a little crack in the technological system where freedom can be experienced" ("Editor's Notes", 238).

79. See for example Robert Bly, *The Science in Science Fiction: Eighty-Three SF Predictions That Became Scientific Reality* (BenBella, 2005); Mark Brake and Neil Hook, *Different Engines: How Science Drives Fiction and Fiction Drives Science* (Macmillan, 2008); Thomas Disch, *The Dreams Our Stuff Is Made Of: How Science Fiction Conquered the World* (Simon & Schuster, 1998); William Shatner and Chip Walter, *I'm Working On That: A Trek from Science Fiction to Science Fact* (Pocket, 2002).

80. Paul Davies, "Putting the Science in Fiction," *Cosmos*, 27 April 2016, <https://cosmosmagazine.com/the-future/putting-science-fiction>.

known officially as the Clarke Orbit.⁸¹ Cryonics founder Robert Ettinger wrote a short story in which a wealthy magnate is refrigerated and later resurrected long before he produced his scientific treatise on the subject.⁸² This is not to say that the relationship between science and science fiction is consistent – while some authors use science fiction to explore existing or plausible developments in scientific theory and technology, others invent “impossible technology” (Gunn gives the example of Le Guin’s ansible) or use the medium for social commentary purposes (e.g. H. G. Wells in *The Time Machine*).⁸³

Cory Doctorow explains the phenomenon of “design fiction” – the commissioning of “what-if” stories by corporations to consider the potential marketability for technological products.⁸⁴ Elsewhere, he argues that “science fiction does something better than predict the future: it *influences* it”.⁸⁵ The connection between science fiction and industry has a long pedigree, as highlighted by the aerospace industry’s use of futurist science fiction imagery in their early advertisements. This link is demonstrated in Figure 1.1 and Figure 1.2.

It is not only the space exploration industry that profits from fictional speculations, computer scientist Mark Pesce makes the bold (if slightly hyperbolic) claim that

The recent history of hard science fiction has been *the* deciding influence on the direction of software development. . . . To the degree they [sci-fi writers] are successful in ‘infecting’ the hacker community with the beauty of their ideas, they can expect to see those ideas brought to life.⁸⁶

The nexus between science fiction and technological development is more recently illustrated in Project Hieroglyph, an online project initiated by the Centre for Science

81. Arthur C. Clarke, “Extra-Terrestrial Relays: Can Rocket Stations Give World-Wide Radio Coverage?,” *Wireless World*, October 1945, .

82. Robert Ettinger, “The Penultimate Trump,” *Startling Stories* 17, no. 1 (1948); c.f. Robert Ettinger, *Youniverse: Towards a Self-Centred Philosophy of Immortalism and Cryonics* (Universal, 2009), 388.

83. Gunn, “Science Fiction Shaping Your Future”.

84. Interviewed in *ibid.*.

85. Cory Doctorow, “I’ve Created a Monster! (And So Can You),” in *Frankenstein, or the Modern Prometheus: Annotated for Scientists, Engineers, and Creators of All Kinds*, ed. David Guston, Ed Finn, and Jason Robert (MIT Press, 2017), 209, emphasis original.

86. Mark Pesce, “Magic Mirror: The Novel as a Software Development Platform,” *MIT Communications Forum*, October 1999, <http://web.mit.edu/comm-forum/papers/pesce.html>.

Two images by graphic artist Arthur Radebaugh removed for copyright reasons.

and the Imagination at Arizona State University. The project offers “a space for writers, scientists, artists and engineers to collaborate on creative, ambitious visions of our near future”.⁸⁷ An anthology produced by the project in 2014, collating fictional visions of the near future based on contemporary science and technology, was recognised by the Association of Professional Futurists for its contribution to futurist studies.⁸⁸ The project reportedly grew out of a desire to re-brand science fiction away from the dystopic tendencies of the genre and instead focus on constructive, optimistic and achievable depictions of the future.⁸⁹ Michael Solana expresses similar hopes for the ability of science fiction to influence perceptions of technology in a more positive way, calling upon writers to tell more optimistic stories.

Our dystopian obsession has grown up in our nightmares as a true monster, which can only be countered by something truly beautiful. Simply, we need a hero. Our fears are demons in our fiction placing our utopia at risk, but we must not run from them. We must stand up and defeat them. Artificial

87. Center for Science and the Imagination, ASU, “Project Hieroglyph,” <http://csi.asu.edu/project-hieroglyph/page/2/>.

88. Joey Eschrich, “Hieroglyph Anthology Earns Futurist Award,” *Centre for Science and the Imagination, ASU*, 7 August 2015, <http://csi.asu.edu/press/news/hieroglyph-anthology-earns-futurist-award/>.

89. Debbie Siegelbaum, “Project Hieroglyph: Fighting Society’s Dystopian Future,” *BBC News*, 4 September 2014, <http://www.bbc.co.uk/news/magazine-28974943>.

intelligence, longevity therapy, biotechnology, nuclear energy – it is in our power to create a brilliant world, but we must tell ourselves a story where our tools empower us to do it. To every young writer out there obsessed with genre, consider our slowly coalescing counterculture, and wonder what side of this you’re standing on. . . . The time is fit for us to dream again.⁹⁰

In yet another indicator of the importance of science fiction for technological inspiration, writer Neil Gaiman shares an anecdote from the first ever state-sponsored science fiction conference in China in 2007. Upon asking a government official why China had shifted away from their previous disapproval and discouragement of science fiction and associated conventions, he received the following response:

Oh, you know for years we’ve been making wonderful things. We make your iPods. We make phones. We make them better than anybody else, but we don’t come up with any of these ideas. You bring us things and then we make them. So we went on a tour of America talking to people at Microsoft, at Google, at Apple, and we asked them a lot of questions about themselves, just the people working there. And we discovered that they all read science fiction when they were teenagers. So we think maybe it’s a good thing.⁹¹

Students at the Massachusetts Institute of Technology (MIT) have in recent years been able to take a class entitled “Science Fiction to Science Fabrication”, which involves reading selected science fiction works, creating functional prototypes inspired by the readings, and then reflecting on the social implications of such technologies.⁹² Again, this is a sign of just how seriously science fiction is treated as a source for fuelling imagination and innovation, at least by the technology industry.

Furthermore, Robert Geraci argues for a strong link between popular science works, which share much in common with some forms of science fiction, and research funding.

The value of the apocalyptic imagination lies in its power to create excitement in the lay public and government funding agencies. Pop science in general, and Apocalyptic AI in particular, is a – sometimes conscious, sometimes

90. Michael Solana, “Stop Writing Dystopian Sci-Fi: It’s Making Us All Fear Technology,” *Wired*, 14 August 2014, <https://www.wired.com/2014/08/stop-writing-dystopian-sci-fiits-making-us-all-fear-technology/>.

91. As cited in Neil Gaiman, “The Pornography of Genre, or the Genre of Pornography,” in *The View From the Cheap Seats: Selected Non-Fiction* (Headline Publishing, 2016), 41.

92. Gunn, “Science Fiction Shaping Your Future”.

unconscious – strategy for the acquisition of cultural prestige, especially as such prestige is measured in financial support.⁹³

Others challenge the degree to which science fiction impacts proper scientific work, with physicist Freeman Dyson stating that “science is my territory, but science fiction is the landscape of my dreams.”⁹⁴ Certainly, we should resist a simplistic approach that draws direct associations between fictional imaginings and complex technological developments. Colin Milburn offers a more nuanced account of modification processes at work in the move from fiction to science, suggesting we might consider the relationship of scientists to science fiction as akin to “fan practice” (even if not all individual scientists are sci-fi fans).⁹⁵ Milburn cites the example of transformation optics and electromagnetic cloaking research inspired by fictional invisibility technologies in the *Fantastic Four* comics, *Star Trek* series, and Harry Potter novels (despite the latter being fantasy, rather than sci-fi) – while the ideas are inspired by fiction, extensive modifications are required to produce a scientifically viable approximation.⁹⁶ Additionally, Milburn interprets the denial of any science fiction influence by some scientists as particularly revelatory – insisting on the absolute autonomy of scientific thought from broader cultural influences.⁹⁷ Instead, Milburn contends, scientists consume culture like any other, but additionally possess the resources necessary for modifying science fiction ideas into usable science.⁹⁸

In examining the mutual influences of science and science fiction, we must, of course, heed Milburn’s warning against overstatement. Science fiction writers are neither prophets nor clairvoyant, and professional science is more than the “fulfillment of literary dreams, diligently turning fantasies into reality”.⁹⁹ There is a degree of overlap between science fiction, however, and the speculations often included at the end of research papers and grant proposals that ruminate on the

93. Geraci, *Apocalyptic AI*, 3.

94. Freeman Dyson, *Imagined Worlds* (Harvard University Press, 1997), 9.

95. Colin Milburn, “Modifiable Futures: Science Fiction at the Bench,” *Isis* 101 (2010), 561.

96. *ibid.*, 567.

97. *ibid.*, 263.

98. *ibid.*, 565.

99. *ibid.*, 561.

potential implications of current research.¹⁰⁰ Many non-fiction works relating to science are highly speculative in nature, ranging from J. B. S. Haldane's *Daedalus* to Kurzweil's *The Singularity is Near*. Milburn highlights the engagement in many nonfiction texts with science fiction in the development of theoretical arguments.¹⁰¹ Joshua Raulerson describes a narrowing speculative feedback loop of the "hyperreal" in which techno-utopian and fringe science movements assert

"a vision of Singularity that increasingly recognizes little if any meaningful distinction whatsoever between its fictive and nonfictive representations, reading both SF and futurist nonfiction as scripts for a redemptive future they await with the oracular self-assurance of the devout."¹⁰²

Given this complex relationship, Milburn makes the valid call for a study of science fiction within the history of science discipline, taking historiographical concerns seriously.¹⁰³ This will require a cross-disciplinary effort, drawing on methodologies from literary and cultural studies in addition to those of history of science. He summarises the contemporary state:

As historians and cultural theorists of science, we are becoming increasingly attentive to the powerful role that scientific speculation, technological forecasting, and promissory futures play in the development of science and to how futurological narratives and road maps function as scripts in the everyday routine of laboratory protocols.¹⁰⁴

Artificial intelligence researchers are also attending to the importance of imagination. The company DeepMind asserts that "if our algorithms are to develop equally sophisticated behaviours, they too must have the capability to 'imagine' and reason about the future. Beyond that they must be able to construct a plan using this knowledge".¹⁰⁵ Imagination is recognised as a central dimension of human cognition, an idea that will be explored further in later chapters of this work.

100. Milburn, "Modifiable Futures", 568.

101. Colin Milburn, "Posthumanism," in *The Oxford Handbook of Science Fiction*, ed. Rob Latham (Oxford University Press, 2014), 529.

102. Joshua Raulerson, *Singularities: Technoculture, Transhumanism, and Science Fiction in the 21st Century* (Liverpool University Press, 2013), 5.

103. Milburn, "Modifiable Futures", 561.

104. *ibid.*, 568.

105. DeepMind, "Agents that Imagine and Plan," <https://deepmind.com/blog/agents-imagine-and-plan/>.

While these reflections focus on the role of science fiction in inspiring technological development, another important function of the genre is to consider the implications of various technologies. Clark Miller and Ira Bennett, both scientists involved in public policy, argue that science fiction is a form of truth-telling, providing us with an “imagined sense of what tomorrow’s forms of life might look like”, and shaping the public imagination through its mode of narrative story-telling.¹⁰⁶ They call for science fiction to be integrated into more rational approaches to technology assessment.¹⁰⁷

The present research will consider the implications of the role of imagination in the development of human enhancement technologies, and the visions of the future shaping popular attitudes towards such technologies, examining how this might inform associated theological responses.

1.3.2 Science Fiction and Expectations of the Future

Perhaps even more apparent than its influence on technological innovation, is the way that science fiction impacts everyday expectations of what the future will be like. This is well illustrated in an article written for financial service professionals – not the first profession that comes to mind when you think of science fiction – that draws almost exclusively on works of science fiction to consider the future of financial services and employment more generally.¹⁰⁸

Sherryl Vint highlights the contemporary dimension of science fiction – while it often addresses the future it also interrogates current anxieties concerning the future.¹⁰⁹ Geraci offers related insights from his experience in the online virtual reality game *Second Life*, through which he investigated the visions of and hopes for the future among aficionados of the game.¹¹⁰

106. Clark Miller and Ira Bennett, “Thinking Longer Term About Technology: Is There Value in Science Fiction-Inspired Approaches to Constructing Futures,” *Science and Public Policy* 35, no. 8 (2008), 600.

107. *ibid.*, 604.

108. Richard Weber, “Where No One Has Gone Before: When Science Fiction Inspires Technology,” *Journal of Financial Service Professionals* 70, no. 4 (2016).

109. Sherryl Vint, *Bodies of Tomorrow: Technology, Subjectivity, Science Fiction* (University of Toronto Press, 2007), 22.

110. Geraci, *Apocalyptic AI*, 3.

Science fiction, according to media theorist Scott Bukatman, “frequently posits a reconception of the human and the ability to interface with the new terminal experience”.¹¹¹ Scott Midson construes the technological explorations in science fiction to be a “way to usefully begin to rethink how we see ourselves in relation to technologies in ways that do not prefigure the (ideal) human through practices of exclusion”.¹¹²

1.3.3 Human Enhancement in Science Fiction

Burdett points out that all transhumanists accept the premise evident in much contemporary science fiction – that humanity will converge with the technology it has produced.¹¹³ Indeed, Bostrom attests science fiction’s capacity to provoke reflection on the future of human evolution.¹¹⁴ Vint considers science fiction a particularly suitable medium for exploring posthuman questions, as it allows us to imagine bodies and selves other than they are at present, it is “a discourse defined by its ability to estrange our commonplace perceptions of reality”.¹¹⁵ Science fiction not only reflects or illustrates theoretical models of the posthuman, it allows models of “possible future selves” to be put forward and identified with by readers.¹¹⁶ Milburn takes this a step further, intimating that science fiction itself may function as part of a posthumanisation process – “reading science fiction might turn you posthuman”.¹¹⁷ Posthumanist discourse is a hybrid, according to Milburn, “mashing together scientific concepts, sociological extrapolations, and SF scenarios”.¹¹⁸

A very brief survey is offered here of the same themes of human enhancement identified with respect to transhumanist visions of the future, with examples of

111. Scott Bukatman, *Terminal Identity: The Virtual Subject in Post/Machine Science Fiction* (Duke University Press, 1993), 118.

112. Scott Midson, *Cyborg Theology: Humans, Technology and God* (I. B. Taurus, 2018), 111.

113. Michael Burdett, *Eschatology and the Technological Future* (Routledge, 2015), 81.

114. Bostrom, “The Transhumanist FAQ”, 40.

115. Vint, *Bodies of Tomorrow*, 19.

116. *ibid.*, 20.

117. Milburn, “Posthumanism”, 525.

118. *ibid.*, 533.

their representation in science fiction.¹¹⁹ Further examples will be highlighted in a later section, as we consider how science fiction might inform theological reflection on human enhancement.

In terms of radical life extension, we might look to Robert Heinlein's character Lazarus Long. Featuring in a number of Heinlein's works,¹²⁰ Long lives for over two thousand years as a result of both selective breeding and rejuvenation therapies. Generally Long and his family are represented positively, though there are political conflicts surrounding an incorrect notion that they possess and are withholding anti-ageing therapies from the wider population. Bruce Sterling's *Holy Fire* (1997), on the other hand, imagines a future in which life-extension technology has taken hold more broadly, and senior citizens have opened an insurmountable gap over younger generations when it comes to wealth and political control.

The cyperpunk genre often explores what it means to be human, and depicts examples of what may be considered transhumans. Seminal works such as William Gibson's *Neuromancer* (1984) and Neil Stephenson's *Snow Crash* (1992) convey a certain indeterminacy when it comes to human nature, and show how intertwined human being is with technology. M. Keith Booker and Anne-Marie Thomas argue that

Cyberpunk not only calls into question what it means to be human, but also suggests that the posthuman is an inevitable consequence of the dissolution of boundaries between human and machine. . . . Cyberpunk is a fictional attempt to grapple with the realities of our postmodern condition.¹²¹

When Case, the protagonist in *Neuromancer*, dismisses the biological body, unaugmented and disconnected from cyberspace, as "meat",¹²² he sounds a lot

119. A more comprehensive survey of science fiction as it engages transhumanist ideas is provided by Burdett, *Eschatology and the Technological Future*. Christina Bieber Lake suggested only a few years ago that visions of the transhumanist future have been insufficiently "fleshed out" in fiction, and locates this as a problem more broadly associated with utopian writing – the impossibility of imagining perfection (Christina Bieber Lake, *Prophets of the Posthuman: American Fiction, Biotechnology, and the Ethics of Personhood* (University of Notre Dame Press, 2013), 169).

120. The first of which is Robert Heinlein, *Methuselah's Children* (Gnome Press, 1958).

121. M. Keith Booker and Anne-Marie Thomas, *The Science Fiction Handbook* (Wiley-Blackwell, 2009), 110.

122. William Gibson, *Neuromancer* (Ace Books, 1984), 6.

like certain transhumanists.¹²³ Mark Dery sums up this attitude to the flesh characterised by cyberpunk fiction and mind-uploading proponents:

It's the body's job to be a symbol of detestable putridity in the eyes of an information society characterized by an exaltation of mind and a contempt for matter, most of all the body – that aging, earth-bound relic of Darwinian evolution that Net junkies refer to as meat.¹²⁴

This disdain for the body is reflected not only in depictions of bodily augmentation, but also in more extreme fictional mind-uploading scenarios. Richard Stallman writes a short story that might even be read as a utopia, in which a human gradually shifts more of his existence onto a virtual platform as his relationship with a virtual “soul mate” progresses, only to experience a fuller joy than he could ever have imagined once the upload is complete.¹²⁵

Of course, not all fictional explorations of enhancement themes are positive as to the outcomes. Robert Sawyer imagines a scenario in which an individual undergoes a non-destructive mind-uploading process, only to end up in identity crisis as both his biological and “artificial” self claim to be more genuine.¹²⁶ James Tiptree Jr's Hugo award-winning novella “The Girl Who Was Plugged In”, features the protagonist P. Burke, a physically deformed teenage girl who is given the chance to realise her dreams of physical perfection and attendant celebrity by escaping her body to become a “Remote”.¹²⁷ With her own brain “plugged in” she is able to control a beautiful body, grown intentionally without a brain, employed by corporate interests to use her celebrity to promote their products (“remote” bodies are preferred for the job as they are more easily controlled than the unpredictable stars of reality).

Philip K. Dick satirises the idea of hedonic recalibration in his acclaimed *Do Androids Dream of Electric Sheep?* (1968). The novel opens with a humorous

123. Compare this with the previously cited comment from Moravec that the body, apart from its information systems, is “mere jelly” (Moravec, *Mind Children*, 117).

124. Mark Dery, *The Pyrotechnic Insanitarium: American Culture on the Brink* (Grove Press, 1999), 142.

125. Richard Stallman, “Made for You,” 2012, <https://ieet.org/index.php/IEET2/more/stallman20121228>.

126. Robert Sawyer, *Mindscan* (Tor, 2005).

127. James Tiptree Jr, “The Girl Who Was Plugged In,” in *Her Smoke Rose Up Forever* (Tachyon Publications, 2004).

vignette concerning the “Penfield mood organ”, which allows its users to dial up such specific moods as “awareness of the manifold possibilities open to me in the future” and “acknowledgment of husband’s superior wisdom in all matters”.¹²⁸ Protagonist Rick Deckard argues with his wife over her deliberate programming of despair using the device.

But then I realized how unhealthy it was, sensing the absence of life, not just in this building but everywhere, and not reacting – do you see? I guess you don’t. But that used to be considered a sign of mental illness; they called it ‘absence of appropriate affect.’¹²⁹

Similarly, the fictional soma in Aldous Huxley’s *Brave New World* (1932) induces a state of content apathy, and reflects some of the more alarming aspects of mood “enhancement” and its potential for control via distraction.

Greg Egan’s short story “Axiomatic” envisions the possibility of neural implants and modifiers that can affect morality, a technology (albeit different in the details) that Savulescu advocates for strongly.¹³⁰ In Egan’s tale, however, this technology is not used to enhance superior moral impulses, but rather to override existing moral “squeamishness” in order to commit vengeful murder. Again the question of motive and power when it comes to the agents using technology is raised.

Chapter Conclusion

The technological enhancement of human characteristics is imagined in diverse ways, both in the proposals of transhumanist advocates and the futures sketched out by science fiction writers. All aspects of human being are targeted in enhancement proposals – intellectual, emotional, physical and even spiritual. These prospective technologies imagine a radically altered existence for humans, or even the emergence of a new successor species of human making. The possibility of engineering such changes to our own existence has unavoidable implications for theological anthropology, and the activity of enhancement through technology will be considered from a theological perspective in subsequent chapters.

128. Philip K. Dick, *Do Androids Dream of Electric Sheep?* (Ballantine Books, 1996), 4, 6.

129. *ibid.*, 5.

130. Greg Egan, “Axiomatic,” in *Axiomatic* (Millennium, 1995).

Are any of us skilful enough to fashion ourselves?

— Augustine of Hippo

*Poor Adam, deviled by your energy,
What power egged you on to feed your brains?
Envy the gorgeous gallops of the sea,
Whose horses never know their lunar reins.*

— Richard Wilbur

2

A Theology of Human Enhancement?

Contents

2.1	Responding Theologically	40
2.2	“Playing God”	42
2.3	The Relationship between Divine and Human Creativity	45
2.3.1	Understanding Human Creativity	51
2.4	The Scope of Creativity: Technology as a Creative Enterprise	56
2.4.1	Co-Creation and Science	57
2.5	Creativity and Fallenness	61

Chapter Overview

The Christian response to technologies that promise to enhance human capacities has been overwhelmingly negative. The charge of “playing God” is often used to dismiss enhancement questions without meaningful engagement. This chapter explores those objections briefly, before moving on to consider the possibility of a more optimistic theological engagement. The lens of human creativity is taken as a starting point, with Trevor Hart’s treatment of the relationship between human and divine creation examined. While Hart focuses on human artistry, accounts that also connect human creating to the work of God in the sciences are introduced.

The theological works and creativity studies that support an analogous relationship between human making and God's creation might be expanded into a theological anthropology that can engage questions of human technological enhancement.

2.1 Responding Theologically

The last chapter demonstrated that there are many types of human technological enhancement, and that endorsement of various enhancements ranges across a spectrum. The most ardent transhumanists, for example, may seek immortality through the uploading of minds to digital substrates, while a more conservative (yet still affirmative) position might advocate the use of genetic and pharmaceutical interventions, or perhaps neural implants, to moderately or substantially improve life span, strength, endurance, intelligence, etc.

Often the term “slippery slope” is used as a justification for why we ought not attempt a particular course of action. But slippery slopes are only dangerous if we fall down them. Their presence should not automatically act as a deterrent, but rather as a warning to proceed with caution. Slippery slopes should prompt us to draw boundaries, to test the ground before each step – not to avoid the surrounding area in its entirety. A theological framework that does not reject all types of enhancement *a priori* will not necessarily approve all forms either.

Another issue surrounding slippery slope arguments is the difficulty of classifying intermediate positions along such a slope. Kurzweil applies this thinking in his argument that technological modification of humans can never produce non-humans. In his view, the difficulty in classifying those with differing degrees of technological modification along the “slippery slope” (contrast someone with a bionic heart with someone possessing thousands of nanobots in their brain) renders all beings along the spectrum as human.¹

1. Kurzweil, *The Singularity Is Near*, 374. Agar counters this argument, however, with the example of baldness – the difficulty in classifying precisely where along the slippery slope to baldness a person can be correctly designated as bald does not render all positions “hirsute” (Nicholas Agar, *Humanity's End: Why We Should Reject Radical Enhancement* (MIT Press, 2010), 54).

Similarly, the impossibility of absolute demarkation between therapy and enhancement must be recognised with respect to many of the technologies being developed. Not only are there problems with assuming that a boundary between health and illness can be discovered, and that a healthy “norm” can be defined, but what may be intended as a therapy to correct a deficiency can have the overall effect of enhancement in some respects. An example of this can be seen in the way that current technologies in running prostheses are considered equal, or perhaps even superior to, biological limbs in athletic competition.² Certain central nervous system stimulants (e.g. Ritalin) are used as therapeutic aids in the treatment of clinical attention deficit disorders, but are increasingly being used as “study aids” by those who are not ill.³

With all these caveats, how might we begin to construct a theological response to proposed human enhancements? Questions surrounding human enhancement present new opportunities for theologians to engage in cross-disciplinary reflection on many of the “big questions”, and to recover a place for God in public discourse. What is our purpose? What constitutes the good life? Do we determine our own destiny? And of particular interest to this research: What is our role in ongoing creation? Cole-Turner speaks for many when he raises the following questions:

Can theology – that communal process by which the church’s faith seeks to understand – can theology aim at understanding technology? Can we put the words God and technology together in any kind of meaningful sentence? Can theology guess what God is doing in today’s technology? Or by our silence do we leave it utterly godless? Can we have a theology of technology that comprehends, gives meaning to, dares to influence the direction and set limits to this explosion of new powers?⁴

2. Peter Weyand et al., “The Fastest Runner on Artificial Legs: Different Limbs, Similar Function?,” *Journal of Applied Physiology* 107, no. 3 (2009).

3. Martha Farah et al., “Neurocognitive Enhancement: What Can We Do and What Should We Do?,” *Nature Reviews Neuroscience* 5, no. 5 (2004).

4. Ronald Cole-Turner, “Science, Technology, and Mission,” in *The Local Church in a Global Era: Reflections for a New Century*, ed. Max L. Stackhouse, Tim Dearborn, and Scott Paeth (Eerdmans Publishing Co., 2000), 101.

2.2 “Playing God”

Many would answer Cole-Turner’s question with a steadfast “No!”, human enhancement proposals having largely been opposed by religious adherents. The charge of “playing God” is often levelled in Christian circles at the prospect of deliberately using technologies to alter, and particularly to enhance, human characteristics.⁵ It is seen as an overstepping of the boundary between Creator and creation. A Pew research study conducted in 2016, for example, showed a stronger rejection of three hypothetical enhancements (gene editing to reduce disease risk, neural implants to improve cognitive abilities, synthetic blood to improve physical abilities) among individuals with higher religious commitment (predominantly Christian) than those with lower religious commitment or none.⁶ Respondents who answered in the negative judged these enhancements as “meddling with nature” and “cross[ing] a line we should not cross”.⁷ Revealing more general perceptions, the popular publication *Christianity Today* published the results with the sensationalist headline “Christians to Science: Leave Our Bodies How God Made Them”.⁸

To date, the genetic aspect of human enhancement has arguably been subjected to the greatest debate by Christian ethicists. The advent of human germline modification technologies has alerted some to the danger of altering our genetic code so far that human nature is compromised in some (often undefined) way. Ronald Cole-Turner is a well-known voice in the intersection of Christian ethics and human enhancement technology. He has written extensively on the Christian response to genetic technologies such as human reproductive cloning, and adopts a more positive stance toward these technologies than many. As a theologian, Cole-Turner is concerned with the public perception of religious views on this topic.

5. The term “playing God”, of course, is most strongly associated with Paul Ramsey (Paul Ramsey, *Fabricated Man: The Ethics of Genetic Control* (Yale University Press, 1970), 138).

6. Pew Research Center, “U.S. Public Wary of Biomedical Technologies to ‘Enhance’ Human Abilities,” July 2016. It should be noted that the overall results, regardless of religious conviction, still indicated a wariness of enhancement; however the opposition was significantly higher when correlated with religion.

7. *ibid.*

8. 26 July, 2016, <http://www.christianitytoday.com/news/2016/july/christians-science-leave-bodies-alone-pew-human-enhancement.html>.

He challenges what he considers to be the widespread assumption that all or most religious scholars are opposed to germline modification, asserting that “nearly all the official statements of religious bodies leave the door open on the question of the morality of genetic modification of human offspring”⁹. He surveys the general misgivings held by various religious bodies over the use of genetic modification, grouping them in a list of four main concerns: (1) safety, (2) the protection of embryos, (3) social and economic justice concerns and (4) a preference for therapy over enhancement.¹⁰ Cole-Turner does not consider any of these concerns to be insurmountable, and provides a brief response to each.¹¹

Despite the evidence he provides, however, many Christian ethicists writing on the subject would still rule out human germline modification even for therapeutic purposes alone. Gilbert Meilaender offers a good example of a commonly held position in Christian ethics with respect to germ cell therapy. In his argument that this technology is beyond the bounds of human finitude he cites C.S. Lewis’ warnings in *The Abolition of Man* against humans gaining too much control over nature.¹² Michael Banner, though he does not deliver a final opinion, expresses his concerns over the use of genetic modification even in non-human animals, questioning whether the practice is consistent with the Christian doctrine of creation.¹³ Even in the secular sphere, a number of philosophers, scientists and other thinkers have expressed reservations over the use of such technologies, and their future consequences for humanity.¹⁴

9. Ronald Cole-Turner, “Religion and the Question of Human Germline Modification,” in *Design and Destiny: Jewish and Christian Perspectives on Human Germline Modification*, ed. Ronald Cole-Turner (MIT Press, 2008), 8.

10. Ronald Cole-Turner, “Religion, Genetics and the Future,” in *Design and Destiny: Jewish and Christian Perspectives on Human Germline Modification*, ed. Ronald Cole-Turner (MIT Press, 2008), 201.

11. *ibid.*

12. Gilbert Meilaender, *Bioethics* (Eerdmans Publishing Co., 2013), 43.

13. Michael Banner, *Christian Ethics and Contemporary Moral Problems* (Cambridge University Press, 1999), 224.

14. Indeed, something approaching a consensus among scientists expresses ethical reservations over the genetic modification of germ cells, although this view is beginning to change (Paul G. McDonough, “The Ethics of Somatic and Germline Gene Therapy,” *Annals of the New York Academy of Sciences* 816, no. 1 (1997), 381).

Of those theologians who do permit human germline modification, the vast majority argue that it should be limited to therapeutic applications, rejecting its use for enhancement purposes (concern four above). Cole-Turner is willing to go a little further than this, endorsing the use of germline modification for human enhancement with a few limitations.¹⁵ There is a certain degree of pragmatism present in Cole-Turner's acceptance of enhancement uses of genetic modification; he acknowledges the often blurred boundary between therapy and enhancement and the likelihood that one will easily lead to the other.¹⁶

Genetic engineering has been considered here as an example of human enhancement that has been treated extensively in theological literature. Christians have written against human enhancement more broadly: Bill McKibben addresses a more general audience in his rejection of enhancements, for example. Not only does he reject genetic engineering even for therapeutic purposes, but he argues against any kind of enhancement on the basis that it undermines the givenness of life and the joy that is often won through struggle (he opens the book by describing the running of a marathon, the experience of both the strength and frailty of human being that he believes future generations will no longer get to experience).¹⁷

Willem Drees argues that the charge of "playing God" is generally rooted in fear, as new technologies shift the boundary between what we accept as given and what we can affect through our own action. "We accuse others of playing God when they have moved what was beyond our powers to our side of the boundary."¹⁸ Acknowledging these fears, the present study considers whether there are resources in Christian theology to indicate or permit a more open, less reactionary response to the prospect of enhancing human abilities with emerging technologies.

15. Cole-Turner, "Biotechnology", 937.

16. Cole-Turner, "Religion, Genetics and the Future", 210–211. He does warn, however, that attempts to distinguish between therapy and enhancement are not merely anthropological in nature, but theological (*ibid.*, 213).

17. Bill McKibben, *Enough: Genetic Engineering and the End of Human Nature* (Bloomsbury Publishing, 2004), 1–3.

18. Willem Drees, "'Playing God? Yes!' Religion in the Light of Technology," *Zygon* 37, no. 3 (2002), 651.

2.3 The Relationship between Divine and Human Creativity

Rather than diving into the development of a specific “theology of technology”, we might fruitfully begin our theological reflections on the prospect of “enhancing” ourselves with the doctrine of creation. The charge of “playing God” commonly leveled at enhancement technologies by religious objectors orients us to the central question: how does human creativity relate to divine? Do sharp demarcations between the creative work of God and the scope of human action exist that would affirm a “playing God” prohibition, or are there parallels between human and divine creativity that might legitimise these technological endeavours?

For a long time, the semantic scope of “creation” rejected the possibility of such parallels and served to underscore the radical otherness of God. Trevor Hart charts the historical shift which saw the notion of *create* extended from its previous preserve of God alone to human artistry.¹⁹ “Creation proper” may still apply solely to the work of God in certain instances, but the idea of creation more generally has expanded in scope.²⁰ In view of this semantic shift, the question of whether humans might appropriately be considered to “create” is the starting point for Hart’s exploration of human making.

Hart returns to the biblical account with a summary of the lexical terms in the Hebrew Scriptures, demonstrating the complexity of Hebrew language of creation beyond the more restricted use of *bārā’*.²¹ The verb *yatsar*, for example, used in Genesis 2:7 to describe God’s fashioning of the human from the earth and in Genesis 2:18 to describe his forming of other animals also, is used of human activity as well (e.g. Isaiah 29:16, Habbakuk 2:18). The term and its cognates invoke strong connotations for us with art and craftsmanship, referring to the work of the potter (likely connected to the “lumps of clay” that made up the raw materials in Genesis

19. Trevor Hart, *Making Good: Creation, Creativity, and Artistry* (Baylor University Press, 2014), 2.

20. *ibid.*, 5.

21. *ibid.*, 5–6.

2:7) and the woodcarver.²² He sketches out the biblical portrayal of God as artist, and contends that we might situate human making within a theology of creation, rather than relegating it to the more distant doctrines of preservation, providence or redemption. “Viewing creation as a project divinely begun and established, yet one that is handed over to us with ‘more to be made of it yet’ and inviting our responsible participation in the making, affords a fruitful perspective on the matter.”²³ Colin Gunton represents creation in a similar fashion, though he orients his work around a doctrine of God rather than human making.²⁴ To illustrate the place of human artistry in this collaboration as it unfolds in scripture, Hart draws on the examples of Noah crafting the ark and the building of the tabernacle.²⁵

Having established the biblical contours of the divine artist metaphor, Hart tracks the metaphor’s divergence from its humble origins in scripture to an ultimate reversal: by the time of the Enlightenment “human artistry was pictured now in terms of God’s artistry rather than vice versa”.²⁶ While the classic and mediaeval understanding of *ars* encompassed human productivity more generally, modern Western notions of “the arts” are far more limited.²⁷ At the same time, they are more audacious, with the notion of art as faithful mimesis giving way gradually through the Renaissance and the Romantic era to the idea of the artist or poet as “creator”.²⁸

Indeed, we can see this shift in thinking beyond the realm of art. Humanist thinkers in the Italian Renaissance accorded great significance to the creative ability

22. Hart provides a more detailed account of these biblical uses, including some translational variations that impact the imagery of Genesis 2:7 (Hart, *Making Good*, 31–33). See also B. Otzen, “Yatsar,” in *Theological Dictionary of the Old Testament*, ed. G. Johannes Botterweck and Helmer Ringgren (Eerdmans Publishing Co., 1990).

23. Hart, *Making Good*, 8.

24. Colin Gunton, *The Triune Creator: A Historical and Systematic Study* (Eerdmans Publishing Co., 1998), 89.

25. Hart, *Making Good*, 40. Though Hart earlier challenges the situating of human artistry within the doctrinal loci of redemption, rather than creation, his linking of redemption and creation in his description of Noah’s work is reminiscent of Jonathan Wilson’s dialectic of creation and redemption (Jonathan Wilson, *God’s Good World: Reclaiming the Doctrine of Creation* (Baker Academic, 2013)).

26. Hart, *Making Good*, 28.

27. *ibid.*, 153.

28. Hart gives a detailed account of this shift, focusing primarily on the development of visual art, in chapter eight of *Making Good*. He nuances the simplistic descriptions often offered by cautioning that the Renaissance period at least was still generally characterised by a view of art as respective mimesis, even as it accorded greater significance to transformation (*ibid.*, 162).

and agency of humans in the world. In 1486, Giovanni Pico della Mirandola pronounced his *Oration on the Dignity of Man*, which outlined the exalted status and creative freedom of humankind. While non-human animals were given specific forms or natures by God, according to Pico, the human is made according to an “indeterminate image” in order that humans might define ourselves.²⁹ God’s address to humans captures the essence of this humanist manifesto.

I have placed you at the very center of the world, so that from that vantage point you may with greater ease glance round about you on all that the world contains. We have made you a creature neither of heaven nor of earth, neither mortal nor immortal, in order that you may, as the free and proud shaper of your own being, fashion yourself in the form you may prefer. It will be in your power to descend to the lower, brutish forms of life; you will be able, through your own decision, to rise again to the superior orders whose life is divine.³⁰

Charles Trinkaus identifies the ascription of creative dominion to humans as a prominent feature in Italian humanist thought.³¹ He describes “an important new concept of man as actor, creator, shaper of nature and history”.³² Humans possess these qualities because they are made in God’s image and likeness.³³ The emphasis on human ingenuity appears to be linked with the Renaissance exultation of humanity’s artistic and technological achievements and potential.³⁴ Giannozzo Manetti writes, for example,

After that first, new and rude creation of the world, everything seems to have been discovered, constructed and completed by us out of some singular and outstanding acuteness of the human mind. . . The world and all its beauties seems to have been first invented and established by Almighty God for the use of man, and afterwards gratefully received by man and rendered much more beautiful, much more ornate and far more refined.³⁵

29. Giovanni Pico della Mirandola, *Oration on the Dignity of Man*, trans. A. Robert Caponigri (Henry Regnery Co., 1956), 4.

30. *ibid.*, 7–8.

31. Charles Trinkaus, *In Our Image and Likeness: Humanity and Divinity in Italian Humanist Thought* (University of Notre Dame Press, 1995), 248, 482–485.

32. *ibid.*, 248.

33. *ibid.*, 248. We will see that the connection between creativity and the *imago Dei* is made often.

34. Richard Bauckham, *Living with Other Creatures: Green Exegesis and Theology* (Baylor University Press, 2011), 44.

35. Giannozzo Manetti, *De dignitate et excellentia hominis* (1542), as quoted by Trinkaus, *In Our Image and Likeness*, 247.

According to Manetti, humans are second creators of a world that is “superimposed on the original divine creation of the natural world”.³⁶

Manetti’s near contemporary, Marsilio Ficino, expressed similar ideas, stating rather cryptically that “human arts make on their own whatever nature itself makes: it is as if we were not her slaves but her rivals.”³⁷ Humans are imitators of divine creativity, and “perfect all the works of lower nature, correcting and emending them”.³⁸ Ficino also included the Greek notion of τέχνη along with the more traditional arts in his description of human creativity.³⁹ Surrounded by the fruits and promise of the burgeoning industry in Renaissance Florence, Ficino concluded in light of humanity’s evident mastery over the world that the human “acts as the vicar of God, since he inhabits all the elements and cultivates all”.⁴⁰ Together these Renaissance thinkers offer an early theology of creation that includes creaturely activity, though obviously with less of a biological dimension to the fashioning of human nature than the approaches that will feature in the current work.

We can trace, therefore, a growing propensity to focus on human creativity that pulls away from the stricter constraints it possessed in earlier thought. This escape trajectory continued through the incorporation of a dominion narrative that seemed more focused on the superiority of human creativity over that below it, rather than its subservient relationship to the divine.⁴¹ Francis Bacon, the Enlightenment thinker often referred to as the “father of modern science”, exemplifies a greater tradition that came to see nature as something to be mastered, a subject of human dominion. Bacon’s position is captured in some of his most well-known lines:

36. Trinkaus, *In Our Image and Likeness*, 247.

37. Marsilio Ficino, *Platonic Theology*, ed. James Hankin and William Bowen, trans. Michael Allen, vol. 4 (Harvard University Press, 2004), XIII:3.

38. *ibid.*, XIII:3.

39. J. M. Cocking, *Imagination: A Study in the History of Ideas*, ed. Penelope Murray (Routledge, 1991), 172. We will return to this theme in later chapters.

40. Ficino, *Theologica Platonica*, vol. 2, 225; trans. (Trinkaus, *In Our Image and Likeness*, 483).

41. Though a comprehensive treatment would be a research project on its own, we can see in these trajectories of thought not just the idea that humans are co-creators but also precursor ideas to the transhumanist philosophies described in the first chapter.

Man by the fall fell at the same time from his state of innocence and from his dominion over creation. Both of these losses can in this life be in some part repaired; the former by religion and faith, the latter by arts and sciences.⁴²

For Bacon, the human task was to recover human dominion over nature in its fullest, an aim that manifests in the title of his incomplete masterpiece *The Great Instauration*. This view led him to make statements laden in tones of mastery such as “I am come in very truth leading you to Nature with all her children to bind her to your service and make her your slave”.⁴³ Bacon extended the vision of Italian humanists by uniting the idea of dominion with the promise of modern empirical science.⁴⁴ The new style of thinking epitomised by Bacon, however, was not only scientific, according to Medawar, but generally optimistic concerning the expansion of human knowledge. The seventeenth century was an age of utopian thought, though the older utopias differed from those of today by referring to contemporary societies, rather than future imaginings.⁴⁵ Thus, the frontispiece to *The Great Instauration* depicts ships freely passing the pillars of Hercules that guard the Straits of Gibraltar (previously thought to mark the end of the known world), and *plus ultra* was the motto taken up by Bacon’s followers.⁴⁶ This emphasis on dominion came to be enmeshed within theological understandings of creation, as “creation” found its way into the vocabulary used for human activities. Hart’s summary of the reversal this effected is worth quoting in full:

Like the artist, it had always been understood, God (albeit in his own “divine” way) fashioned a world with great skill and wisdom, producing something good and pleasing and for the identifiable benefit of all concerned. Like God, it now came increasingly to be held, the artist (albeit in his own “creaturely” way) was concerned to call something radically novel and unprecedented into existence rather than merely replicating or imitating an object to order from a given design or template — something that was the product of his own personal and inner vision rather than the dictates of any external circumstance,

42. Francis Bacon, “*Novum Organon* 12.52,” in *The Works of Francis Bacon*, ed. James Spedding, Robert Ellis, and Douglas Heath (Longman, 1858), IV: 247–248.

43. Francis Bacon, “The Masculine Birth of Time,” in *The Philosophy of Francis Bacon: An Essay on its Development from 1603–1609*, ed. Benjamin Farrington (Liverpool University Press, 1964), 62.

44. Bauckham, *Living with Other Creatures*, 50.

45. P. B. Medawar, “On ‘The Effecting of All Things Possible’,” in *The Hope of Progress* (Methuen & Co., 1972), 127.

46. *ibid.*, 122.

something in the fashioning of which he might properly expect by the exercise of his will and power to transcend the limits ordinarily supposed to belong to his chosen materials, and something the result of which was intended first for his own personal delight and satisfaction before that of others.⁴⁷

This does not mean, however, that it is inappropriate to speak of humans as genuinely “creative”. Drawing on support from the likes of Walter Brueggemann, Terence Fretheim and Jürgen Moltmann, Hart concludes that:

at various key points in the story of God’s creative fashioning of a world fit for his own indwelling with us, divine artistry actively solicits a corresponding creaturely creativity, apart from which the project cannot and will not come to fruition.⁴⁸

But Hart takes pains to orient the sense in which we might think of human artistry as genuine creativity to an earlier understanding of what artistry entails. *Craftmanship*, as we understand it now, is in some ways a more helpful term.⁴⁹ God is the master craftsman, with humans analogous to the apprentice in the master’s workshop. In such an analogy, “the existence of certain established limits or boundaries is to the fore: there are considerations of authority and obedience to be observed, traditional ways of working with which faith must be kept, accepted standards of excellence to be acknowledged and pursued”.⁵⁰ Within this context, though, genuine freedom and ingenuity operates, nurtured and schooled within the Master’s domain.⁵¹ Rather than forming order out of chaos by human innovation, as artistry has come to be understood, the artist works within the divinely ordered cosmos.⁵² The “otherness” of God must not be undermined in the analogy of human creativity to divine;⁵³ this is taken as a foundational commitment that underpins the exploration of human creativity in the present work.

47. Hart, *Making Good*, 189–190.

48. *ibid.*, 37.

49. A full genealogy and semantic treatment of “art”, “craft” (and “technology”, introduced later) is not offered here, as all are treated as aspects of human making involving creativity. Hart reminds us that the relegation of art to the realm of recreation and play, as opposed to useful work, is a product of modern theory, and “art” and “craft” were essentially equivalent terms prior to the Renaissance *ibid.*, 21–22.

50. *ibid.*, 43.

51. *ibid.*, 43.

52. *ibid.*, 197.

53. *ibid.*, 214.

2.3.1 Understanding Human Creativity

Creativity Studies

Always acknowledging the alterity of God, the parallels between God's creative work and our own may be illuminated by examining the mechanics and nuances of human creativity as a concept. This is the task of the burgeoning field of creativity studies, which highlights the interdisciplinarity of its purview.

Whereas Hart focuses on the shifting understanding of human artistry as creativity, physicist David Bohm takes a broader perspective. Exploring the relevant etymologies, he illustrates how science, art, and technology all have their origins in a sense of what is "fitting", and spring from the same basic human impulse.⁵⁴ Gilles Deleuze and Felix Guattari similarly contend that creation can occur across the intersecting planes of philosophy, art, and science, the rich overlapping of which leads to an inevitable degree of unpredictability.⁵⁵ Margaret Boden goes even further in her demonstration of the breadth of creativity, not only considering human creativity in science and technology, but also raising the possibility of machine creativity.⁵⁶ The breadth of human creativity has been described in a recent popular work, *The Runaway Species*, which draws parallels between the ingenuity of NASA engineers in addressing mechanical emergencies during the Apollo 13 mission, and the innovative artistic works of Picasso.⁵⁷ The similarities and differences between science, art, and technology will be explored further in later chapters of this work, as we consider how different perspectives on human creativity may enrich one another.

Rob Pope's expansive study *Creativity: Theory, History, Practice* considers the ramifications of industrialisation for the language of creativity, and the associated Marxist shift to the vocabulary of "production".⁵⁸ A more recently renewed interest

54. David Bohm, *On Creativity* (Routledge, 2003), 80–86.

55. Gilles Deleuze and Felix Guattari, *What Is Philosophy?*, trans. Graham Burchell and Hugh Tomlinson (Verso, 1994), 163–199.

56. Boden acknowledges the difficulties in judging machine outputs as truly creative, though contends that they certainly *appear* to be creative (Margaret Boden, *The Creative Mind: Myths and Mechanisms* (Routledge, 2004), 7–12, 277–304).

57. Anthony Brandt and David Eagleman, *The Runaway Species: How Human Creativity Remakes the World* (Catapult, 2017).

58. Rob Pope, *Creativity: Theory, History, Practice* (Routledge, 2005), 7–8.

in creativity is traced through its increased emphasis on efficiency and results, rather than exploration.⁵⁹ By way of an exploration of various related terms (e.g. “inspiration” or “generation”), Pope ranges across cosmogonies and cosmologies in his provision of a culturally and historically sensitive account of creativity. Though he does not treat the relationship between divine and human creation from the perspective of a Christian worldview, he does draw links more generally between religious creation myths and human creativity,⁶⁰ and his emphasis on the importance of metaphor and language resonates with themes picked up later in the present work.

Other contributions from the field of creativity studies focus more on defining and describing the mechanics of creativity, rather than the intellectual history of its usage.⁶¹ While the lack of precision or agreement over a definition is acknowledged,⁶² some insights from the field are surveyed in brief. Creativity involves discovering possibilities in the world (natural and social), then bringing them into being.⁶³ Novelty features in definitions of creativity — Boden, for example, permits the term “creative” to properly apply only to radically original ideas.⁶⁴ Nor is creativity homogenous — Boden describes creativity in terms of novel recombinations, as well as explorations and transformations of conceptual spaces.⁶⁵ Typologies that distinguish nuances of creativity are proffered, from Boden’s *P-creativity* vs. *H-creativity* (differentiating between the psychologically and historically creative) to James Kaufman and Ronald Beghetto’s “Four C Model” that delineates creativity by degree, generality and professionalism.⁶⁶ The multiplicity of typologies, though

59. Pope, *Creativity*, 26–27.

60. See especially *ibid.*, chapter 5.

61. Though many studies purport to address creativity, surprisingly few offer a definition (Jonathan Plucker, Ronald Beghetto, and Gayle Dow, “Why Isn’t Creativity More Important to Educational Psychologists? Potentials, Pitfalls, and Future Directions in Creativity Research,” *Educational Psychologist* 39 (2004)).

62. Keith Sawyer, *Explaining Creativity: The Science of Human Innovation* (Oxford University Press, 2006), 36.

63. Lee Martin and Nick Wilson, “Defining Creativity With Discovery,” *Creativity Research Journal* 29, no. 4 (2017), 420.

64. Boden, *The Creative Mind*, 51.

65. *ibid.*, 4.

66. *ibid.*, 43–49; James Kaufman and Ronald Beghetto, “Beyond Big and Little: The Four C Model of Creativity,” *Review of General Psychology* 13, no. 1 (2009).

each may provide certain insights, is testament to the wide-ranging use of the concept and its interest across disciplines.

While much scholarship in creativity studies focuses on the mechanics of how creativity works, Lee Martin and Nick Wilson highlight the origin of novelty as crucial for a proper understanding of creativity.⁶⁷ Pope discusses the effect of the present “crisis of subjectivity” to surround our understanding of creativity’s source of inspiration with uncertainty.⁶⁸ This is where theological accounts make a valuable contribution: human creative novelty has its origins in the divine.⁶⁹ Research has also suggested a positive correlation between awe and creative insight,⁷⁰ another finding that coheres with a divine dimension to creativity.

Creativity studies also recognise a value dimension to creativity – the products of genuine creativity must be evaluated as “good” by a community consensus.⁷¹ When Robert Weisberg argued for the exclusion of value judgments in deeming something “creative”, objections were raised by creativity studies scholars.⁷² Again this validates a connection between creativity and morality, and fits well with a theistic explanation for making such a connection.

Bringing together the consensus of much of the creativity studies field, and aligned with the changing understanding of creativity traced from its biblical origins through a Renaissance expansion of scope, Boden’s description of creativity as “the

67. Martin and Wilson, “Defining Creativity”, 418.

68. Pope, *Creativity*, 18. For a comprehensive treatment of this idea, see Timothy Clark, *The Theory of Inspiration: Composition as a Crisis of Subjectivity in Romantic and Post-Romantic Writing* (Manchester University Press, 1997).

69. Martin and Wilson do not claim a theistic rationale, though it would render their assertions about creativity novelty more coherent.

70. Alice Chirico et al., “Awe Enhances Creative Thinking: An Experimental Study,” *Creativity Research Journal* 30, no. 2 (2018).

71. Mark Runco and Garrett Jaeger, “The Standard Definition of Creativity,” *Creativity Research Journal* 24, no. 1 (2012). Runco identifies a mutual benefit between the culture of a community and the creativity of those within it (Mark Runco, *Creativity: Theories and Themes: Research, Development, and Practice* (Academic Press, 2014), 222). Interestingly, moral value as an essential characteristic of creativity is more strongly articulated in Eastern perceptions than Westerners, a phenomenon that is perhaps linked with the increased focus on utility in the West already discussed (Weihua Niu and Robert Sternberg, “Contemporary Studies on the Concept of Creativity: The East and the Western,” *Journal of Creative Behavior* 36 (2002)).

72. Robert Weisberg, “On the Usefulness of ‘Value’ in the Definition of Creativity,” *Creativity Research Journal* 27 (2015); c.f. David Harrington, “On the Usefulness of ‘Value’ in the Definition of Creativity: A Commentary,” *Creativity Research Journal* 30, no. 1 (2018).

ability to come up with ideas and artefacts that are *new, surprising and valuable*” serves as a helpful definition for the present study.⁷³ Furthermore, Boden highlights the universality of human creativity – while expert knowledge is often involved, we all possess creative power to some degree, grounded in our “ordinary human abilities”.⁷⁴ Understanding the relationship of this human capacity to the divine work of creation requires further theological resources.

A Theological Understanding

Hart is able to synthesise these insights from creativity studies into a theological account. He takes Todd Lubart’s somewhat dry definition of creativity (in particular, artistry) arising through “a confluence of environment-centered variables and person-centered variables,” and reconstructs these limitations as a gift to which the recipient can imaginatively respond and hand on in turn (i.e. it becomes a part of the tradition).⁷⁵ Many artists attest to this sensibility of having received a gift, and the limits and responsibilities thus entailed.⁷⁶ Hart cites Tolkien’s sense of creativity as uncovering meaning that is given, arguing that such meaning “can be traced directly to the ultimate provenance of all human artistry in the primordial plenitude of God’s own creative work”.⁷⁷ Tolkien’s theology of sub-creation will be re-visited and developed in chapter five of this work.

Theological accounts offered by the likes of Jacques Maritain and Dorothy Sayers, scholars contemporaneous with Tolkien, whose account of human creativity will be explored in depth in chapter five of this work, reinforce the theological significance of human making and its proper place within a doctrine of creation. Maritain describes the creativity of the artist as a development of divine creation, a work proceeding from the whole soul which bears the image of God.⁷⁸ Though he

73. Boden, *The Creative Mind*, 1, emphasis original.

74. *ibid.*, 22.

75. Hart, *Making Good*, 250–251. Hart is directly quoting Todd Lubart, “Creativity Across Cultures,” in *Handbook of Creativity*, ed. Robert Sternberg (Cambridge University ATF Press, 1999), 339.

76. Hart, *Making Good*, 262.

77. *ibid.*, 265.

78. Jacques Maritain, *Art and Scholasticism and the Frontiers of Poetry*, trans. J. Evans (C. Scribner’s Sons, 1962), 122.

distinguishes the creation of God (who is able to truly generate another substance through divine utterance) and human works of creating (which can only ever be signs), Maritain nevertheless grounds the dignity of art in his assertion that it “realizes in act one of the fundamental aspects of the ontological likeness of our soul with God”.⁷⁹ Sayers, too, locates human creativity in our being made in the image of a triune Creator.⁸⁰ She articulates a Trinitarian anthropology first through a character in her play *The Zeal of Thy House*, an analogy that she then unpacks in *The Mind of the Maker*.⁸¹ “Every work of creation is threefold”, she writes, “an earthly trinity to match the heavenly”.⁸² Human creativity is broken down into the Creative Idea, the Creative Energy, and the Creative Power, analogous of the Father, Word, and Holy Spirit, respectively.⁸³ Charles Raven had previously drawn a trinitarian analogy with the human artist, outlining:

The artist’s will which purposes to create the picture and the impulse which prepares pigments and canvas is God the Father ... the artist’s conception of the complete picture, his cartoon of the grand design ... is God the Son ... the artist’s energy, the vital and creative activity whereby is produced upon the canvas of matter the perfect image which the will has planned and the vision conceived is God the Holy Spirit.⁸⁴

The details of these trinitarian comparisons would make an interesting comparative study,⁸⁵ but for the present purpose they serve to underscore a relationship between

79. *ibid.*, 122.

80. Dorothy Sayers, “Vocation in Work,” in *A Christian Basis for the Post-War World*, ed. A. E. Baker (SCM Press, 1942), 90.

81. Dorothy Sayers, *Four Sacred Plays* (Victor Gollancz, 1948); Dorothy Sayers, *The Mind of the Maker* (HarperCollins, 1987).

82. Sayers, *Four Sacred Plays*, 103.

83. *ibid.*, 103. The orthodoxy and sufficiency of her treatment of the Trinity is beyond the present scope here, however the cautions of Kilby (among others) against projecting human ideals onto the immanent Trinity bears remembering (Karen Kilby, “Perichoresis and Projection: Problems with Social Doctrines of the Trinity,” *New Blackfriars* 81, no. 957 (2000)).

84. As cited in Frederick Dillstone, *Charles Raven: Naturalist, Historian, Theologian* (Eerdmans Publishing Co., 1975), 87.

85. Christine Fletcher, for example, highlights the increased social dimension of Sayer’s analogy compared with Raven’s, and thus argues it is a stronger foundation for theological anthropology Christine Fletcher, *The Artist and the Trinity: Dorothy L. Sayers’ Theology of Work* (The Lutterworth Press, 2014), 77. Hart gives an exposition of Sayer’s analogy and how it both develops and departs from R. G. Collingwood’s and Maritain’s aesthetics (Hart, *Making Good*, 267–273).

human creativity and the work of God as Creator.⁸⁶ Though he does not address the trinitarian aspect, Robert Miner derives a similar conclusion from his study of Aquinas' account of human making (particularly in terms of art) and its relation to divine creation.

Because Aquinas does not imagine human making to occur within a de-sacralized, sheerly human territory, but understands it rather as a mode of participation in the divine, it may be said that human construction acquires a significance that is difficult for modern secular perspectives to appreciate. It becomes a privileged site where God speaks through the creature, the agent of divine providence.⁸⁷

To locate human creativity and an associated theological anthropology within an overarching doctrine of creation is thus warranted.

2.4 The Scope of Creativity: Technology as a Creative Enterprise

Hart, like the theologians discussed above, treats human creativity primarily in terms of artistic enterprise, though he acknowledges its broader application to other human activities. Affirming that only God bestows existence upon the creaturely, he includes in the rubric of creation biblically attested activities that require our participation for creation's completion: "planning, making, shaping, forming, developing, and so on". The chief contention of the present work is that technology, and specifically the development of technologies for enhancing human capacities, falls within the scope of this creaturely contribution to creation. Furthermore, technology, as a domain of human creativity, can benefit from the insights of the field of creativity studies, and the theological reflections on creativity and the imagination that have concentrated more on the arts to date.

Of course, it is not a new development to treat technology as a mode of creativity. Pope draws our attention to the corporatisation of "creativity" in technological

⁸⁶. This project has continued into contemporary scholarship, see for example Brian Horne, "Art: A Trinitarian Imperative," in *Trinitarian Theology Today: Essays on Divine Being and Act*, ed. Christoph Schwöbel (T & T Clark, 1995).

⁸⁷. Robert Miner, *Truth in the Making: Creativity Knowledge in Theology and Philosophy* (Routledge, 2013), 18.

programmes of this century; its wedding to neoliberal politics.⁸⁸ A prime example is Kimberley Seltzer’s and Tom Bentley’s *The Creative Age: Knowledge and Skills for the New Economy*, which outlines a goal-oriented and problem-solving approach to creativity bearing little resemblance to the understanding of creativity articulated above.⁸⁹ The aim here is to consider technology in light of the more comprehensive scope of creativity described thus far, and within a theological framework. The decision to ground this theological treatment of human enhancement technology within a doctrine of creation and theology of human creativity garners support from a long history of identifying humans as “co-creators” with God. Hart’s description of the “corresponding creaturely creativity” which God conscripts into the broader project of creation finds (albeit perhaps indirect) precedents and allies in the thought of various individuals and movements.

2.4.1 Co-Creation and Science

In addition to the arts, we find correlations between human and divine creativity in the sciences. Mary Midgley explores the impact of the dominion rhetoric associated with human creativity on later conceptions of science. “It is notorious that Bacon regularly described scientific activity in oddly savage imagery, incorporating violent conquest as a central part of his original myth of scientific supremacy.”⁹⁰ Humans are not merely to guide the course of nature with a gentle hand, but to “storm and occupy her castles and strongholds and extend the bounds of human empire”.⁹¹ Indeed, this rhetoric re-surfaced in the 1981 encyclical *Laborem exercens*, issued by Pope John Paul II, focused on the significance of human work. Technology is named as an ally as “man in a sense continues to develop [the Creator’s] activity”,⁹² praised as “the fruit of the work of the human intellect and a historical confirmation of

88. Pope, *Creativity*, 26.

89. Kimberley Seltzer and Tom Bentley, *The Creative Age: Knowledge and Skills for the New Economy* (Demos, 1999); c.f. Pope, *Creativity*, 26.

90. Mary Midgley, *Science and Poetry* (Routledge, 2001), 41.

91. Francis Bacon, “Of the Dignity and Advancement of Learning,” in *The Works of Francis Bacon*, ed. James Spedding, Robert Ellis, and Douglas Heath (Garrett Press, 1860), 372–373.

92. John Paul II, *Laborem Exercens* (Vatican, 1981), §5.

man's dominion over nature".⁹³ The co-creation metaphor has found favour among many other scientists too. The French Jesuit priest, philosopher and paleontologist Pierre Teilhard de Chardin famously described humans as "evolution become aware of itself".⁹⁴ While Teilhard was not very well received in his own time, there has been a recent resurgence of interest in his work as theologians engage with contemporary evolutionary theory.⁹⁵ Teilhard conceived of biological and cultural history advancing toward what he termed the "Noosphere", the "thinking envelope of the Earth" – a collective consciousness that encompasses the entire planet.⁹⁶ Technology is integral to the Noosphere, and Teilhard envisioned that it might one day be used to enhance individual human beings.⁹⁷ For Teilhard, humanity's evolution is driving and being pulled (by God) toward the "Omega Point", culminating in the "Ultra-Human" who is drawn into union with the cosmic Christ.⁹⁸ Burdett locates the difference between Teilhard's eschatological vision and that of contemporary transhumanism in Teilhard's insistence on the transcendence signified by the historical Christ;⁹⁹ yet Teilhard certainly takes his place in a trajectory of thought that understands human nature to be changing, and subject to change at the hands of human agents.

Arthur Peacocke, both an Anglican priest and trained biochemist, also names humans as co-creators. Writing especially in response to ecological concerns, he argues that through the evolutionary process humans now represent a medium for divine creativity.

...to be co-creator with the 'living God' who always actualizes in his creation new possibilities, previously unimagined humanly speaking, is to be prepared always to adjust creatively and deliberately to the changes necessary for God's purposes to be fulfilled...¹⁰⁰

93. John Paul II, *Laborem Exercens*, §5.

94. Pierre Teilhard de Chardin, *The Phenomenon of Man*, trans. Bernard Wall (Harper & Row, 1961), 220; he derives this idea from Julian Huxley, "Transhumanism," in *New Bottles for New Wine* (Chatto & Windus, 1957).

95. For example, Pope Francis cited Teilhard in the 2015 encyclical *Laudato Si'*.

96. Pierre Teilhard de Chardin, *The Future of Man*, trans. Norman Denny (Collins, 1964), 132.

97. Pierre Teilhard de Chardin, *Activation of Energy*, trans. Renè Hague (Collins, 1970), 160.

98. Teilhard de Chardin, *The Future of Man*, 276–305.

99. Burdett, *Eschatology and the Technological Future*, 135.

100. Arthur Peacocke, *Creation and the World of Science: The Bampton Lectures 1978* (Clarendon Press, 1979), 316.

Peacocke echoes Teilhard in the description of humans as creation conscious of itself.¹⁰¹ Exploring the creative potential of humans as displayed in technological ingenuity, Peacocke contends that

man now has, at his present stage of intellectual, cultural, and social evolution, the opportunity of consciously becoming co-creator and co-worker with God in his work on Earth, and perhaps even a little beyond Earth.¹⁰²

Though he uses the term “re-creation” instead of “co-creation”, Jesuit philosopher W. Norris Clarke also foregrounds technology in the human task “to recreate the world that has been given him, malleable and plastic under his fingers, to be transformed by his own initiative and artistic inventiveness.”¹⁰³ The end result is an expression of something new, reflecting both the divine and human images.¹⁰⁴

A long list of other sources, from theology, science and the arts, could be cited that conceive of human as co-creators, but this would merely be labouring the point. The range of human endeavours treated under the label of co-creation mirrors the interdisciplinarity already identified in the study of creativity as a phenomenon. Of course, many accounts of humans as agents of creation focus on non-human creation as the object of the creative work and human mastery, and not all would extend the scope of co-creation to include humans as its object. But we also see the notion that human “nature” is to some degree within our power to alter. Extending Hart’s treatment of human making to the prospect of human enhancement technologies is therefore warranted, and potentially very fruitful.

As Peter Scott argues, theologians must reckon with “the technological factor” today. Scott calls for a reconstruction of theological anthropology that does justice to humanity’s place in a technological society.¹⁰⁵ This is the task of the present

101. *ibid.*, 301.

102. *ibid.*, 304. Hefner, whose work will be the focus of the next chapter, draws much from the work of Peacocke, indeed he is eloquent in his praise of Peacocke’s “most winsome of God-concepts, that of the cosmic composer of fugues who interweaves chance and necessity, novelty and order, simplicity and complexity, who engages in creation and redemption as the Lord of the Dance” (*THF*, 94; c.f. *ibid.*, 104–111).

103. W. Norris Clarke, “Technology and Man: A Christian Vision,” *Technology and Culture* 3, no. 4 (1962), 427–428.

104. *ibid.*, 428.

105. Peter Scott, “The Technological Factor: Redemption, Nature, and the Image of God,” *Zygon* 35, no. 2 (2000), 371.

work, particularly as theological anthropology informs our views on using technology to enhance human capacities. Furthermore, the exploration of human enhancement issues demands a consideration of technology itself, and the place it occupies in human activity. Yet technology is a very broad category. Stephen Kline surveys the different uses of the term “technology”, highlighting its ambiguity.¹⁰⁶ He arrives at the composite meaning of “sociotechnical systems of manufacture and use”, arguing that this pattern has been used by humans and their evolutionary ancestors for the past two million years to extend their capabilities.¹⁰⁷ “Technology” in the sense that Kline uses it, therefore, is not solely the product of a “high-tech age”, but has affected our evolutionary path.¹⁰⁸ While much has been written from theological and philosophical perspectives on technology more generally, the focus in this work will be restricted to material that has especial relevance for the human enhancement context. Kline’s use of technology will be adopted as a working definition.

A theological anthropology that is able to engage human enhancement questions must also be commensurate with scientific insights. This opens broader questions of the relationship between science and theology which can only partially be explored here, but are the focus of a growing field of study. Suffice it to say that human enhancement proposals are founded on the understanding that contemporary humans are the product of a long and complicated evolutionary process, an assertion that has various implications for traditional Christian doctrines such as creation and the *imago Dei*. In developing a theological anthropology that can address questions pertinent to human enhancement, Hart’s understanding of human creativity must be expanded to accommodate our evolutionary history.

The understanding of humans as co-creators is well attested in Christian thought, and is taken as a natural starting point in exploring whether the prospect of enhancing human abilities with technology might be compatible with orthodox Christianity. To determine whether such a position might gain traction in dialogue

106. Stephen Kline, “What Is Technology?,” *Bulletin of Science, Technology & Society* 5, no. 3 (1985).

107. *ibid.*, 217.

108. *ibid.*, 217.

with human enhancement concerns, the present work will explore in detail what is arguably the most sustained account of humans as co-creators in recent time that incorporates scientific perspectives: Philip Hefner's "created co-creator" model of theological anthropology. Hefner's work will be examined in terms of the way he perceives and frames the relationship between science and theology, the place accorded to both technology and creativity in his theological anthropology, contextualised in evolutionary history, and whether his proposals are able to engage transhumanist visions of the future in a robust manner.

2.5 Creativity and Fallenness

Though a caution has already been issued against claiming too much for human creativity at the expense of its subordination to divine creation, a further limitation must be registered. To what extent is human creativity impacted by the systemic reality of sin? A harmartiology is beyond the present scope, yet it must be acknowledged from the outset that human creativity is only exercised within the confines of a fallen world. Hart makes the relevant point, though that

epistemological undecidability (the unavailability of pure presence, unmediated meaning, or absolute certainty) is arguably part of what makes us morally responsible beings at all and calls forth from us imaginative and "creative" responses to situations rather than excusing our failure to engage in initiatives designed to pursue and promote the good, the true, and the beautiful.¹⁰⁹

Our freedom may not be unbounded, but this does not preclude our making significant creative contributions to the world and future that God is bringing about. Just as the technological nature of transhumanist visions necessitates a corresponding engagement with technology and related scientific concerns on the part of theologians who would respond to transhumanism, so also the imaginative dimension of transhumanism, particularly evident in its relationship with science fiction, also suggests that the imagination ought to receive attention in theological responses to the movement. In particular, the imagination's role in epistemology

109. Hart, *Making Good*, 240.

and communication of knowledge warrants exploration in this context. Furthermore, theological engagement with human enhancement proposals will need to promote a robust ethic and vision of human flourishing that can sustain virtue in a technological environment. Later chapters will offer further reflection on the epistemic limitations that impinge on moral discernment.

Chapter Conclusion

This chapter has explored the relationship between human and divine creation, and the development of theological accounts that support an analogy between the two. Insights from the field of creativity studies are compatible with the notion that human creativity is connected to God's creative work, and the treatment of human creativity within a broader doctrine of creation makes sense on the basis of this relationship. This theological understanding has led to the description of humans as co-creators with God, particularly in connection to the sciences. Building on Hart's compelling case for correspondence between human and divine creativity within the artistic realm, this project now turns to the field of science and religion for Hefner's account of co-creation, more specifically directed to technological activity, to determine its utility as theologians engage with the various challenges surrounding human technological enhancement.

Part II

Responding Theologically to Human Enhancement

*To be human is to know what it feels like to be
evolution happening.*
— Terrence Deacon

*Like a twig caught in the raging current of a storm-
roiled river, the fruits of the method are more in the
realm of hope than of certainty.*
— Philip Hefner

3

Humans as “Created Co-Creators”

Contents

3.1	The Created Co-Creator in Context	66
3.1.1	The Theological Task	66
3.1.2	The Lakatosian Research Programme	68
3.1.3	The Created Co-Creator Model	73
3.2	Theological Coherency	93
3.2.1	How Lakatosian is the Created Co-Creator Model?	98
3.3	The Created Co-Creator as a Response to Human Enhancement Issues	104
3.3.1	Co-Creation and Technology	104
3.3.2	The Theological Application of the Created Co-Creator to Biotechnological Issues	109
3.3.3	The Limits of Co-Creation	117
3.3.4	The Role of the Imagination for the Created Co-Creator	122

Chapter Overview

Philip Hefner offers a contemporary theology of co-creation with his “created co-creator” metaphor for understanding human creativity. This chapter will expound Hefner’s model in the context of its wider intellectual framework, exploring his adoption of scientific methodology for theological exposition and the resulting reformulations of the doctrines of God and sin. His aim of articulating a scientifically

falsifiable theology is evaluated against contemporary scientific claims and the utility of his work for a theological response to the challenges posed by human enhancement is considered.

3.1 The Created Co-Creator in Context

Hefner's particular version of co-creation stands in continuity with the long tradition of considering human nature to be malleable. While the history of co-creation theology is important for understanding Hefner's particular representation of the concept, it forms only part of the context in which we must locate his thought. A history of interacting with natural scientists, and an interest in fostering dialogue between science (particularly evolutionary biology) and theological enquiry, are evident in his work and thus shape his conclusions concerning human creativity.

3.1.1 The Theological Task

Hefner's understanding of the theological task illuminates his created co-creator model and associated reframing of various doctrines. Early in his career, Hefner defines the task of theology as follows:

Theology stands under a double responsibility – to preserve the Christianness of its statements while at the same time speaking relevantly to the situations in which it finds itself. Theology must, therefore, recapitulate its essential Christian character in every present moment so as to be genuinely alive, Christianly speaking, within the circumstances which its environment sets before it.¹

For Hefner, the circumstances set before him, for which he attempts to recapitulate certain Christian doctrines, include the evolutionary account of human origins. Indeed, he states his own objective in the preface to *The Human Factor* as the provision of “a theological anthropology in the light of the natural sciences.”² He calls on theologians to “reconsider how scientific knowledge and revealed theology can interact, so that they may inform human life more wisely in an age of science

1. Philip Hefner, *Faith and the Vitalities of History* (Harper & Row, 1966), 183.

2. Hefner, *THF*, xiii.

and technology.”³ Hefner writes in response to what he perceives to be a global crisis brought about by poor human choices, both wilful and unwitting.⁴ Furthermore, he identifies an intellectual dissonance, claiming that:

... although science and technology are more clearly a premise of our continued existence than ever before, signs are everywhere that people are dissatisfied with the thesis of secularization, which holds that religion and metaphysics are vestiges of our human infancy that will be supplanted by scientific knowledge. We desire a religion and metaphysics that work for us as we seek meaning in our present situation.⁵

His understanding of the natural world as “God’s greatest project” leads Hefner to claim that “theology is not on track unless it can interpret the traditions of the religious communities as revelation about the natural order.”⁶ He is even more blunt in his assertion that “theology as explanation is dead unless it learns to integrate within itself elements of scientific understandings that undergird explanation for our time in history.”⁷ While he does not offer a detailed account of how he understands the relationship between theology and science, Hefner does reject an overly simplistic identification of science with the “what?” questions and religion with the “why?” questions. He summarises his own position as follows:

... science sets forth the description of the teleonomic structures and processes of nature, including human nature, while religion, through myth and ritual, speaks of the way in which those structures and processes are to be interpreted and the specific directions they are to take within the parameters of what they are capable of.⁸

According to Hefner, his major work on the created co-creator was written to answer the central question: “Just who are we human beings and what are we here for?”⁹ Hefner’s purpose, methodology, and assumptions will be interrogated more fully, however this context needs to be acknowledged from the outset.

3. Philip Hefner, “Sociobiology, Ethics and Theology,” *Zygon* 19 (1984), 190.

4. Hefner, *THF*, 4.

5. *ibid.*, 10.

6. *ibid.*, 75.

7. *ibid.*, 219. Note that this comment is in response to contemporary claims of religious naturalists.

8. *ibid.*, 213. He avoids the NOMA approach, however, with a subsequent claim that science may offer hermeneutical insights, and religion may add to our knowledge of teleonomy.

9. *ibid.*, 4.

3.1.2 The Lakatosian Research Programme

A logical starting point for understanding Hefner's model is his own summary of his core claim.

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 that 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.¹⁰

Indeed, this passage appears to be the major source drawn upon by many who cite Hefner on co-creation. Hefner situates this claim, however, within a whole framework of ideas that seeks to express and reinterpret traditional theological concepts through the application of a particular methodology for the progression of scientific knowledge. It is worth noting that Hefner's created co-creator model is usually abstracted from his thought in its entirety and treated as a self-sufficient concept.¹¹ A real engagement with Hefner on co-creation must also give consideration to the "hypotheses" he extrapolates from his portrayal of humans as created co-creators, as well as the way in which his formula reinterprets traditional doctrines of God, sin and Christology. This section will therefore set out Hefner's adoption of scientific methodology to articulate the created co-creator concept and evaluate the success of such a move.¹²

At first glance, Hefner's major work *The Human Factor* bears little resemblance to most theological monographs. Given his stated objective to integrate science and theology in his exposition of human nature, it is not surprising that his account borrows much from scientific methodology. For Hefner, scientific formulations become relevant to theology when theologians seek to articulate explanations of

10. Hefner, *THF*, 27.

11. Elaine Graham expresses concern that the theological underpinnings of Hefner's model tend to get overlooked in discussion of the created co-creator metaphor (Elaine Graham, "Bioethics after Posthumanism: Natural Law, Communicative Action and the Problem of Self-Design," *Ecotheology* 9, no. 2 (2004), 194–195).

12. A full exploration of how Hefner's account reinterprets traditional doctrines will not be included here as the focus will be on the epistemological questions associated with using scientific frameworks to make theological claims.

general human experience that transcend the religious tradition.¹³ He goes even further to say that theological statements must “observe the [scientific] canons of dealing with a wide range of data, falsifiability, and fruitfulness” in order to convey truth successfully beyond their particular religious tradition.¹⁴

In his own efforts to express theological concepts in a manner commensurate with scientific theory Hefner is particularly indebted to Imre Lakatos’ model of scientific research programmes. A Hungarian philosopher of science and contemporary of Karl Popper and Thomas Kuhn, Lakatos’ understanding of scientific knowledge acquisition attempts a corrective to both Popper and Kuhn.¹⁵ In place of Kuhn’s understanding of scientific reasoning in terms of *successive* paradigms, Lakatos instead sees *competing* research programmes.¹⁶ He criticises Kuhn’s subjection of scientific belief to non-rational standards of acceptance,¹⁷ and he seeks to improve on Popper’s theory of falsification by acknowledging that counter-instances are not always decisive for the abandonment of a scientific hypothesis.¹⁸ Rather, a theory is falsified and replaced when a new theory arises that has greater explanatory power and can account for novel facts.¹⁹

The Lakatosian research programme has several components. At its heart is

13. Philip Hefner, “Theology’s Truth and Scientific Formulation,” *Zygon* 23, no. 1 (1988), 264.

14. *ibid.*, 264.

15. While Lakatos is critical of Kuhn, we may understand his position as closer to a refinement than a critique of Popper’s theories – he describes his own work as a “sophisticated falsificationist” position. He also combats the characterisation of Popper’s position as “naive falsificationist”, arguing that while this was true of Popper’s earlier thought he eventually developed a much more sophisticated notion of falsification in the 1950s (Imre Lakatos, *The Methodology of Scientific Research Programmes*, ed. John Worrall and Gregory Currie, vol. 1 (Cambridge University Press, 1978), 91-93; Imre Lakatos, “Criticism and the Methodology of Scientific Research Programmes,” *Proceedings of the Aristotelian Society* 69 (1968)). Lakatos states his debt to Popper in his assertion that he “[looks] at continuity in science through ‘Popperian spectacles’” (Lakatos, *Methodology of Scientific Research Programmes*, 90).

16. Nancey Murphy, *Theology in an Age of Scientific Reasoning* (Cornell University Press, 1990), 59.

17. Lakatos charges Kuhn with reducing scientific revolution to “a matter for mob psychology” and denying any role to rationality in the process (Lakatos, *Methodology of Scientific Research Programmes*, 91; c.f. Thomas Kuhn, “Logic of Discovery or Psychology of Research?,” in *Criticism and the Growth of Knowledge*, ed. Imre Lakatos and Alan Musgrave (North-Holland Publishing Co., 1970)).

18. Lakatos, *Methodology of Scientific Research Programmes*, 4, 92.

19. *ibid.*, 31–33.

what Lakatos terms the “hard core” – the basic idea.²⁰ Generally the nature of the claims in the hard core means that it cannot be directly falsified or verified – it is “‘irrefutable’ by the methodological decision of its proponents”.²¹ The veracity of such claims, however, can be indirectly upheld or impugned through the testing of associated “auxiliary hypotheses”.²² These take the form of “observational” hypotheses which may change in response to observed anomalies; they can be adjusted in response to counter-instances and thus “bear the brunt of tests” in service to the hard core.²³

Characteristic of the Lakatosian research programme is the articulation of a set of methodological rules: the *negative heuristic* “tell us what paths of research to avoid” while the *positive heuristic* tell us “what paths to pursue”.²⁴ In a bona fide research programme the auxiliary hypotheses must be formulated in accordance with the positive heuristic i.e. they must represent an increase of knowledge.²⁵ The negative heuristic forbids the application of a *modus tollens* form of argumentation to the hard core itself, instead redirecting the burden of proof to the “protective belt” of auxiliary hypotheses.²⁶ These hypotheses can then be reformulated in response to falsifying data, while the hard core remains intact. As Murphy points out, a certain “dogmatism” is required for scientific progress – the negative heuristic allows space for a theory to be fully developed instead of prematurely discarded.²⁷ In Lakatos’ adroit phrase, the scientist through observation may “be encouraged by Nature’s *yes*, but not discouraged by its *no*.”²⁸

The key evaluative criteria of a scientific proposal for Lakatos is its fruitfulness in generating new insights.²⁹ A research programme is eventually discarded if it is judged to be degenerative (i.e. no longer producing new ideas) and waning in

20. Hefner equates the “hard core” with Kuhn’s concept of the “paradigm” (Hefner, “Theology’s Truth”, 270).

21. Lakatos, *Methodology of Scientific Research Programmes*, 48.

22. *ibid.*, 48.

23. *ibid.*, 48.

24. *ibid.*, 47.

25. *ibid.*, 95.

26. *ibid.*, 48.

27. Murphy, *Theology in an Age of Scientific Reasoning*, 60.

28. Lakatos, *Methodology of Scientific Research Programmes*, 50n.

29. That is, its “heuristic power” (*ibid.*, 52).

influence rather than progressive.³⁰ According to Lakatos this renders the shift between a degenerating research programme to a progressive one a rational shift, as opposed to the irrational paradigm shift proposed by Kuhn.³¹

Hefner is explicit about his borrowing from philosophies of science, and the way he translates these insights into the theological context. He does acknowledge that a scientific methodology is not immediately applicable to theology without some kind of transformation.³² Rather than importing Popper’s or Lakatos’ models wholesale, he suggests

...that they be adapted heuristically rather than literally, endorsing the suggestions that theological theories should be referred to the world of possible experience, and that it is desirable to discern what a possible theory negates as well as what it affirms.³³

One example of modification is Hefner’s extension of a research programme’s production of new “facts”, a criterion for fruitfulness within the Lakatosian framework, to include new interpretations of existing knowledge.³⁴

Theological statements differ from scientific statements in the precision of empirical content and predictive ability.³⁵ Obviously, theological statements must make some reference to God. For this reason Hefner rejects Popper’s model of falsification in favour of Lakatos’ refinement. The concept of “God” itself is not falsifiable. A notion of the divine may, however, reside in the “hard core” of the Lakatosian framework, shielded from direct falsification by the “protective belt” of auxiliary hypotheses yet also testable on these same grounds.³⁶

30. *ibid.*, 48. Of course, the same criticism that Lakatos levels at Kuhn may be applied here – the determination of a programme’s fruitfulness is subjective and is therefore arguably as non-rational as the Kuhnian paradigm shift. The point at which a degenerative programme is judged to be no longer capable of becoming progressive again is not obvious to discern. Even Murphy, an advocate of Lakatos’ method, highlights the difficulty of ruling out “nonscientific maneuvers” in the effort to preserve the core theory of a research programme that is otherwise degenerative (Murphy, *Theology in an Age of Scientific Reasoning*, 59).

31. Lakatos, *Methodology of Scientific Research Programmes*, 91–92.

32. Hefner, *THF*, 23.

33. *ibid.*, 24.

34. Hefner, “Theology’s Truth”, 270.

35. *ibid.*, 269.

36. *ibid.*, 269.

Hefner does acknowledge the challenges inherent in applying even a modified scientific framework to theology – particularly the lack of consensus (within or outside the theological community) concerning the falsifiability of theological ideas.³⁷ Additionally, the notion of fruitfulness as an evaluative measure may meet some resistance within the theological community, which has traditionally concerned itself with what is right and true.³⁸ With this context established, however, Hefner sets out to construct theological proposals that conform to the structure of a scientific research programme and its requirements of falsifiability (i.e. potential falsifiers and permissible conditions can be identified with respect to the claims he places in the hard core).³⁹ Furthermore, the theological task requires that “theological statements will be used in theory-construction that conforms to the criteria of falsifiability and fruitfulness”, as part of theology’s “explanatory function for general human experience”.⁴⁰

Hefner is not the only, or even the first, theologian to find the Lakatosian structure valuable for theological explanation. Early in her career, Murphy adopted a Lakatosian framework in areas of her work (and Hefner owes much to Murphy’s interpretation of Lakatos), however she later rejected Lakatos’ model in favor of Alasdair MacIntyre’s understanding of rationality.⁴¹ Robert Russell values the work of Imre Lakatos for theological thought,⁴² while Karl Peters,⁴³ Philip Clayton,⁴⁴ and Gregory Peterson all engage with the model in their theological writings.⁴⁵ Hefner

37. Hefner, *THF*, 25.

38. *ibid.*, 26. A more developed account of the relationship between fruitfulness and truth may go some way to answering such resistance.

39. *ibid.*, 25.

40. Hefner, “Theology’s Truth”, 268.

41. Murphy, *Theology in an Age of Scientific Reasoning*; Nancey Murphy and Warren Brown, *Did My Neurons Make Me Do It? Philosophical and Neurobiological Perspectives on Moral Responsibility and Free Will* (Oxford University Press, 2007); Hefner, *THF*, 23.

42. Robert Russell, “Cosmology from Alpha to Omega: Response to Reviews,” *Zygon* 45, no. 1 (2010), 238.

43. Karl Peters, “Empirical Theology in Light of Science,” *Zygon* 27, no. 3 (1992).

44. Philip Clayton, *Explanation from Physics to Theology: An Essay in Rationality and Religion* (Yale University Press, 1989).

45. Gregory Peterson, “The Scientific Status of Theology: Imre Lakatos, Method and Demarcation,” *Perspectives in Science and Christian Faith* 50 (1988).

argues that a Lakatosian framework can also be applied to Wolfhart Pannenberg’s theology, and Pannenberg accepts this characterisation of his work.⁴⁶

In determining whether Hefner’s adoption of a Lakatosian framework for theological explanation is a valid move, two questions must first be addressed. The first concerns the acceptability of Lakatos’ model itself – does it provide an adequate account of the progression of scientific knowledge? Secondly, how does Lakatos’ criterion of fruitfulness relate to truth, and what are the implications of this distinction for our understanding of theological knowledge? Both questions are outside the present scope, relying on detailed philosophical argumentation, however they have been explored elsewhere by the author.⁴⁷

3.1.3 The Created Co-Creator Model

Acknowledging potential vulnerabilities in Hefner’s dependence on Lakatos, and the complexity of reaching a final resolution of associated philosophical questions, we will allow for now that a Lakatosian framework is a reasonable choice for formulating theological statements. This section therefore provides a detailed exposition of Hefner’s created co-creator model within the structure of a Lakatosian research programme. As Hefner insists that the protective belt of hypotheses are empirically testable, a brief evaluation of the scientific testability and evidential support for each hypothesis will be provided. Though Hefner often uses the term “science” in generic ways, the scope here will largely concern insights from evolutionary biology and evolutionary psychology in particular (and climatology to a lesser extent) as most relevant to Hefner’s claims.

Hefner’s oft-cited statement on the subject of the created co-creator actually functions as the hard core of his proposal within the Lakatosian framework.⁴⁸

46. Hefner’s characterisation, and Pannenberg’s acceptance, occurred via a written dialogue in *Zygon* (Philip Hefner, “The Role of Science in Pannenberg’s Theological Thinking,” *Zygon* 24, no. 2 (1989), 146-148; Wolfhart Pannenberg, “Theological Appropriation of Scientific Understandings: Response to Hefner, Wicken, Eaves, and Tipler,” *Zygon* 24, no. 2 (1989), 258-259).

47. Victoria Lorrimar, “Are Scientific Research Programmes Applicable to Theology? On Philip Hefner’s Use of Lakatos,” *Theology and Science* 15, no. 2 (2017).

48. While Hefner articulated earlier models of the created co-creator, this study considers the model elaborated in *THF* in 1993 to be the most comprehensive and representative of Hefner’s mature thought on the concept.

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 that 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.⁴⁹

Having provided this empirical description of human nature, Hefner proceeds to articulate a theological theory within a Lakatosian framework that aims to explain the empirical description and form part of the normative grammar of Christian faith.⁵⁰ Building on the core claim stated above, he elaborates on the “theological theory” by breaking down its essential aspects into “core elements” and identifying various “auxiliary hypotheses” associated with each that can be tested for their fruitfulness and thus support the core of his proposal.

Core Element 1

The first “core element” is as follows: “The human being is created by God to be a co-creator in the creation that God has brought into being and for which God has purposes.”⁵¹ He summarises this in the more recognised term “created co-creator.” The adjective “created” denotes the “conditionedness” of human beings, both as located within an ecosystem and as recipients of a genetic nature that is bestowed on the individual rather than chosen.⁵² Humans did not place themselves within the evolutionary process, thus are not superior to any other creatures within the same ecosystem.⁵³ Rather, humans are characterised by a sense of belonging among all creatures.⁵⁴

“Co-creator”, on the other hand, emphasises the freedom of humans to make decisions and construct contextualising narratives in which these decisions are

49. Hefner, *THF*, 27.

50. *ibid.*, 32.

51. *ibid.*, 35.

52. Hefner points out that even genetic engineering does not prevent individuals from receiving a genome that they did not choose themselves (*ibid.*, 36).

53. *ibid.*, 36.

54. Philip Hefner, “The Foundations of Belonging in a Christian Worldview,” in *Belonging and Alienation: Religious Foundations for the Human Future*, ed. Philip Hefner and Widick Schroeder (Centre for the Scientific Study of Religion, 1976), 163.

made.⁵⁵ Hefner considers co-creation a distinctive quality of humans, though he warns against its application in service to anthropocentric ends.⁵⁶ Yet the co-creator remains contingent on God as creator and is creative in a derivative sense.⁵⁷

This brings us to the auxiliary hypotheses that Hefner assigns to the understanding of humans as created co-creators. The first of these concerns “teleonomy”, the apparent purposefulness of various structures and processes in biological systems (unlike “teleology”, teleonomy does not ascribe purposefulness to human or divine intent). While Hefner believes that *teleological* claims about nature can only be asserted on the basis of faith, *teleonomic* responses to certain biological structures and processes can be discerned empirically.⁵⁸ He argues for a teleonomic axiom that hypothesises the purpose and meaning of something based on its structure.⁵⁹ Theologically, Hefner argues for a version of natural law theology by grounding this teleonomic axiom in God’s creative action.⁶⁰ Both naturalistic and theological perspectives “would conclude that nature is all we possess as the chief source for understanding what the world is about”.⁶¹ He formulates the testable hypothesis as follows:

Hypothesis 1

Integral to *Homo sapiens* and its evolutionary history are certain structures and processes, the requirements for whose functioning may be said to constitute, at least in a tentative way, goals and purposes for human life.⁶²

Hefner preempts challenges to this hypothesis on the basis of the naturalistic fallacy, arguing that the teleonomic axiom does not involve crass, unreflective moves from is to ought, but rather speaks in tentative and careful ways of both the possibility and the necessity to make such moves.⁶³

55. Hefner, *THF*, 38.

56. *ibid.*, 38–39.

57. *ibid.*, 39.

58. *ibid.*, 39.

59. *ibid.*, 40.

60. *ibid.*, 40.

61. *ibid.*, 40. This appears to be at odds with some understandings of divine revelation, however Hefner makes the valid case that all revelation must occur within nature (*ibid.*, 40).

62. *ibid.*, 40.

63. *ibid.*, 58.

According to Hefner, this hypothesis is testable in the same way that all descriptions of structures and processes can be evaluated for their accuracy and adequacy.⁶⁴ The meaning and purpose of creatures must be continuous with the equipment with which they are endowed. Humans are equipped with “self-awareness, decision-making, action, and self-assessment based on the reception of complex feedbacks [*sic*]” – Hefner argues that this natural equipment is a good fit for the purpose of the created co-creator.⁶⁵ It is this fit that can be subjected to testing. Hefner speaks in terms of kinship, citing nucleotide sequence comparisons and comparative morphological studies as evidence for human continuity with processes applicable to the “whole of nature”.⁶⁶ He presents the ecological model as empirical support for the natural structures in which humans live.⁶⁷

Plenty of scientific studies support the continuity of human morphology with that of other species. Until it was superseded by molecular analyses, comparative morphology (comparing observable characteristics between species) was the major tool underpinning the construction of phylogenies (branched diagrammes representing the order in which a groups of species share a common ancestor).⁶⁸ Entire “trees of life” are built through the identification of homologous structures in two separate species derived from a common ancestor. Advances in molecular analyses have only added to what was already inferred from the cruder morphological comparisons.⁶⁹

The notion that structure in some way implies function is also well attested in scientific thought. In molecular biology, for example, functional protein studies infer information about the putative function of a protein based on structural elements and the underlying DNA sequence. Among its many applications, this principle underpins the prediction of transmembrane proteins through the identification of coding regions for hydrophilic protein segments (i.e segments able to cross a

64. Hefner, *THF*, 41.

65. *ibid.*, 58–59.

66. *ibid.*, 65.

67. *ibid.*, 65.

68. Mark Ridley, *Evolution*, 3rd ed. (Blackwell Publishers, 2004), 425.

69. A good summary of these developments can be found in Jaume Bertranpetit and Francesc Calafell, “Genome Views on Human Evolution,” in *Evolution: From Molecules to Ecosystems*, ed. Andrés Moya and Enrique Font (Oxford University Press, 2004).

membrane) using the entire genome sequence of an organism.⁷⁰ As many similar examples could be offered, Hefner can reasonably claim that this first hypothesis receives some support from available scientific evidence.

Yet there is a difference between inferring function from structure and Hefner’s more ambitious claim that purposes and goals can be constituted by natural structures and processes. Scientists would generally balk at extrapolating a larger purpose or goal from the structure of an organism. The debate surrounding teleology in the natural sciences was well underway at the time of Hefner’s writing, and continues today. An exploration of this debate is beyond the current scope, however Luisi provides a helpful summary.⁷¹

While Hefner does use the term “teleonomy” in place of teleology, it is questionable whether the created co-creator function can be extrapolated from teleonomic notions alone. Some would argue that all uses of the term teleonomy are thinly-veiled teleological statements. Though tongue-in-cheek, a little truth can be found in David Hull’s quip:

Haldane [in the 1930s] can be found remarking, ‘Teleology is like a mistress to a biologist: he cannot live without her but he’s unwilling to be seen with her in public.’ Today the mistress has become a lawfully wedded wife. Biologists no longer feel obligated to apologize for their use of teleological language; they flaunt it. The only concession which they make to its disreputable past is to rename it ‘teleonomy’.⁷²

There are sustained attempts to reconcile contemporary science with the notion of teleology, such as Terrence Deacon’s account of emergence that rejects substance dualism in favour of property dualism.⁷³ While Hefner’s choice to use teleonomic language is certainly more palatable to many scientists, the validity of defining the human as co-creator on this basis is debatable. Therefore, while parts of this

70. Anders Krogh et al., “Predicting Transmembrane Protein Topology with a Hidden Markov Model: Application to Complete Genomes,” *Journal of Molecular Biology* 305 (2001).

71. Pier Luigi Luisi, *The Emergence of Life: From Chemical Origins to Synthetic Biology* (Cambridge University Press, 2016), 244.

72. David Hull, “Philosophy and Biology,” in *Philosophy of Science: Contemporary Philosophy: A New Survey*, ed. Guttorm Fløistad (Nijhoff, 1982).

73. Terrence Deacon, *Incomplete Nature: How Mind Emerged from Matter* (Norton, 2012).

hypothesis are supported by scientific conclusions, in its entirety it makes claims potentially beyond the reach of scientific discovery.

The second auxiliary hypothesis is closely related to the first:

Hypothesis 2

The meaning and purpose of human beings are conceived in terms of their placement within natural processes and their contribution to those same processes.⁷⁴

Nature is the “progenitor” of *Homo sapiens* and thus gives insight into human purpose, with humans defined as “the diviner[s] of ultimate meanings within the natural processes”.⁷⁵ The ultimate purpose of humans is not to build up the human community, or even service to God, but rather to serve the whole creation. “The direction God-ward leads us reflexively to nature.”⁷⁶

In testing this hypothesis, “nonhuman nature may provide clues to the character and purpose of human being”, and the consequences of certain human behaviours (wholesome or destructive) toward the rest of nature are taken into account.⁷⁷ In some ways this is an expansion of the first hypothesis, considering human function not only in light of its own structures but in the context of the structure of the entire natural order in which it is embedded. If assuming a goal or purpose based on an organism’s biological structure is problematic for some, assuming a purpose beyond the organism’s own requirements to those of other species is even less plausible to those who would reject teleological arguments. The problems associated with scientifically supporting the teleological claims of the first hypothesis thus apply to this hypothesis as well.

It is straightforward enough to argue that human behaviour has consequences for the rest of nature – such a claim would be more or less universally accepted. We can even say, as mentioned above, that it is in our best interests to act in ways that are wholesome for the rest of nature. But does it necessarily follow that the purpose

⁷⁴. Hefner, *THF*, 41.

⁷⁵. *ibid.*, 73.

⁷⁶. *ibid.*, 60.

⁷⁷. *ibid.*, 41.

of human being is therefore to act beneficially for the whole of nature? How do we understand situations in which judgement is required over which aspect of nature to prioritise i.e. various interests are in competition? This shifts this hypothesis into the speculative realm, and if Hefner is to properly avoid challenges on the basis of the naturalistic fallacy then his proposal must retain its tentative nature. This is not a claim that can be sustained or rejected on the basis of scientific insights alone.

A pragmatic criterion for truth emerges with the second hypothesis and leads to the third:

Hypothesis 3

A concept of “wholesomeness” is both unavoidable and useful as criterion governing the behaviour of human beings within their natural ambience, as they consider what their contribution to nature should be.⁷⁸

Hefner suggests that a definition of wholesomeness, which appears to be an ambiguous criterion, can be arrived at via consensus.⁷⁹ Hefner describes the criteria for this hypothesis as pragmatic, arguing that human action will have to be “empirically discernible as in some way beneficial”.⁸⁰ Indeed, the assertion that humans should act to benefit nature is hardly objectionable. Many examples of humans acting in opposition to this goal could be provided, however Hefner is not hypothesising that all action must be beneficial, only that wholesomeness is an appropriate criterion for action.

It makes logical sense that in the context of an ecosystem, where the harming of one participant is detrimental to all, it is in the interests of humans that their action toward the rest of nature should be wholesome. This goes for all participants, however, not only those capable of conscious reflection. Such a statement does not necessarily constitute a hypothesis or merit a place in a scientific research programme. Nor does Hefner’s stated means of validation with respect to this particular hypothesis – consensus. Scientific consensus has been incorrect at various points in history and this is likely to continue (hence the requirement for ongoing

78. *ibid.*, 42.

79. *ibid.*, 42.

80. *ibid.*, 61.

research and the construction of sophisticated philosophies of theory acceptance and change). If granted the status of a hypothesis, however, we might ask how the wholesomeness criterion could be falsified? By identifying a different criterion that serves equally well? The difficulty of articulating a means of falsification is another indication that the hypothesis is not adequately formulated. In this case, it appears that Hefner is stretching the understanding of what constitutes a hypothesis. His claim that wholesomeness should govern human behaviour toward the rest of nature is reasonable, but not significant when it comes to the scientific validation of his model.

As these first three hypotheses establish that nature is the domain for human purpose, Hefner proposes a fourth hypothesis concerned with this special status accorded to the natural order:

Hypothesis 4

Nature is the medium through which the world, including human beings, receives knowledge, as well as grace. If God is brought into the discussion, then nature is the medium of divine knowledge and grace.⁸¹

In this Hefner follows the urging of Joseph Sittler, who emphasised that human history only transpires within the larger context of natural history.⁸² Hefner further argues that the human mind must also be perceived as an entity of nature, citing representations of the mind's emergence in the context of evolutionary epistemology.⁸³

In his location of human meaning and purpose within the natural order Hefner challenges what he considers to be the dominant understanding of our relationship to nature.

81. Hefner, *THF*, 42.

82. *ibid.*, 58; c.f. Joseph Sittler, "The Sittler Speeches," in *Center for the Study of Campus Ministry Yearbook*, ed. Phil Schroeder (Valparaiso University Press, 1978), 31–32.

83. Hefner, *THF*, 61; c.f. Karl Peters, "Religion and an Evolutionary Theory of Knowledge," *Zygon* 17 (1982), 392–393; Robert Richards, *Darwin and the Emergence of Evolutionary Theories of Mind and Behavior* (University of Chicago Press, 1987), 574–593.

Instead of relatedness and kinship, [prevailing symbol systems] speak of our responsibility for nature as its stewards or masters, and of the possibilities nature presents to us for exercising our creative abilities and propensities to reshape it, to make it conform to us and serve us. In the main, humans have symbolized their work upon nature as furthering its development and improving it, thus placing the weight of the good on the side of *doing unto* nature rather than accepting a place *within* it.⁸⁴

Rather, nature is “God’s great project” – we must resist instrumentalising non-human nature and instead recognise that our task concerns the most wholesome future for all of nature.⁸⁵

Hefner construes this hypothesis as a truism, yet contends that it can be tested by determining the plausibility of statements about knowledge or grace derived from nature in light of our understandings of human nature.⁸⁶ This leads to the question of whether plausibility is an appropriate scientific criterion. Certainly the claim that all knowledge that humans can obtain is mediated through nature is unobjectionable – scientists would be in agreement with this. The human brain is a natural entity and the medium by which we acquire knowledge.⁸⁷

Hefner does not stop with the mediation of knowledge, however, but also hypothesises that nature mediates grace. What he means by grace is not immediately clear, especially as he distinguishes between grace and divine grace. Regardless of his meaning, however, the inclusion of divine grace in his statement puts the burden of proof (if he wishes his hypothesis to be scientifically sound) on the existence of divine grace. The hypothesis that nature is the medium by which divine grace must be experienced, *should divine grace exist*, is acceptable scientifically, supported by current understandings of epistemology and potentially falsified if an instance of received knowledge unmediated by nature could be identified. As it stands, however, this hypothesis again makes claims that extend beyond the purview of scientific verification.

84. Hefner, *THF*, 67, emphasis original.

85. *ibid.*, 74.

86. *ibid.*, 42, 61.

87. The citations Hefner gives for the natural status of the mind offer scientific support for this. See footnote 83.

Core Element 2

Hefner identifies a second core element to his thesis that humans are created co-creators:

The conditioning matrix that has produced the human being – the evolutionary process – is God’s process of bringing into being a creature who represents the creation’s zone of a new stage of freedom and who therefore is crucial for the emergence of a free creation.⁸⁸

Hefner reduces this statement to the challenge of “interpreting the evolutionary process as the work of God” – a major challenge, in his view, for the contemporary theologian.⁸⁹ Natural selection processes in particular raise questions of theodicy that Hefner addresses later in the volume.⁹⁰ The emphasis here is on the freedom that emerges from the evolutionary matrix. For Hefner, the unavoidability of human freedom is almost tautological, which only makes sense when he goes on to define freedom not primarily in terms of liberty or ability to shape the world but rather as a “condition of existence”.⁹¹ Despite their apparent negation of each other, freedom and determinism are dialectical for Hefner – “freedom requires the structure of determinism for its becoming” and the “causal context” is enabled by freedom “to persist in new and different ways”.⁹² Insights from the field of epigenetics “clarifies how a deterministic biological system can favour the emergence of freedom”.⁹³ While freedom and determinism can exist in conflict, producing fear, we are constantly seeking situations in which they are consonant with respect to our human destiny.⁹⁴

Associated with the conditioning matrix core element are a further two auxiliary hypotheses.

Hypothesis 5

88. Hefner, *THF*, 42.

89. *ibid.*, 42.

90. *ibid.*, 271.

91. *ibid.*, 97.

92. *ibid.*, 115.

93. *ibid.*, 116.

94. *ibid.*, 117, 121.

Freedom characterizes human existence as the condition in which humans have no choice but to act and to construct the narratives and symbols that contextualize that action. Such contextualization provides justification, explanation, and norms for guiding and assessing the action. This condition is intrinsic to the evolutionary processes at the level of *Homo sapiens*.⁹⁵

The testability of this hypothesis is linked to its utility for understanding humans and their relationship with nature (including other humans). Hefner gives two examples to make his case: the choice of whether to prolong a parent’s life using medical intervention, and the development and implication of environmental policies that require assigning comparative values to different forms of life. Both instances require not only human decision but also the construction of stories that justify such decisions (like instructions to honour our parents and to serve as stewards to the creation).⁹⁶ With respect to the latter, the centrality of narrative construction to the human mind is well attested in the human sciences. Karl Peters, to use one of the examples put forward by Hefner, highlights the constructivist element of the human central nervous system – the ability to construct contextualising narratives has enabled humans to evolve as they have.⁹⁷ Hefner also cites neuroscientist William Calvin in his argument that the brain’s capacity to observe and interpret information through the constructing of meaningful narratives is crucial for survival.⁹⁸ More recently this is supported by social psychologist Jonathan Haidt, who argues that the human mind is essentially a story processor.⁹⁹

The question of freedom is more complex. Scientifically speaking, Hefner points us to Theodosius Dobzhansky’s exploration of genetically determined phenotype plasticity and the explanation this offers for the emergence of freedom within an evolutionary framework.¹⁰⁰ He cites the more recent (at the time of his writing) work

95. *ibid.*, 45.

96. *ibid.*, 98.

97. Karl Peters, “Humanity in Nature: Conserving Yet Creating,” *Zygon* 24 (1989).

98. William Calvin, *The Cerebral Symphony: Seashore Reflections on the Structure of Consciousness* (Bantam Press, 1989).

99. Jonathan Haidt, *The Righteous Mind: Why Good People are Divided by Politics and Religion* (Vintage Books, 2013), 287.

100. Hefner, *THF*, 99; c.f. Theodosius Dobzhansky, *The Biological Basis of Human Freedom* (Columbia University Press, 1956), 68.

of Rodney Holmes and Terrence Deacon as an extension of Dobzhansky's insight.¹⁰¹ More recently, Moczek *et. al.* have connected phenotypic plasticity with evolutionary innovation.¹⁰² This should not be equated with freedom, however, indeed Moczek *et. al.* struggle to reconcile the apparent paradox between the Darwinian notion that every new trait is somehow derived from an old one, and the existence of complex novel traits.¹⁰³ The language of freedom, and an understanding of how it fits within processes of evolution, again reaches beyond the explanatory capacity of science, though such an understanding may be compatible with scientific knowledge.

The second hypothesis attached to this core element reiterates one of the central ideas in Hefner's core claim.

Hypothesis 6

Homo sapiens is a two-natured creature, a symbiosis of genes and culture.¹⁰⁴

We see here the beginnings of an idea that is prominent in Hefner's theological anthropology – human beings are the product of “biocultural” evolution. This is a natural process in which our genetic and cultural heritages combine to produce free agents that are now capable of shaping future evolution.¹⁰⁵ Hefner describes this “two-natured character” of humans as follows:

Homo sapiens is itself a nodal point wherein two streams of information come together and co-exist. The one stream is inherited genetic information, the other is cultural information. Both of these streams come together in the central nervous system. Since they have coevolved and coadapted together, they are one reality, not two.¹⁰⁶

101. Terrence Deacon, “Brain-Language Co-Evolution,” in *The Evolution of Human Languages*, ed. John Hawkins and Murray Gell-Mann (Addison-Wesley, 1992); Rodney Holmes, “Did *Homo Religiosus* Emerge from the Evolution of the Brain?,” *Insights: The Magazine of the Chicago Centre for Religion and Science* 3 (1991).

102. Armin P. Moczek et al., “The Role of Developmental Plasticity in Evolutionary Innovation,” *Proceedings of the Royal Society B: Biological Sciences* 278, no. 1719 (2011), 2705.

103. *ibid.*, 2705.

104. Hefner, *THF*, 45.

105. *ibid.*, 28–29.

106. *ibid.*, 29. This understanding is not original to Hefner, here he draws heavily on the work of Goldsmith (Timothy Goldsmith, *The Biological Roots of Human Nature: Forging Links Between Evolution and Behavior* (Oxford University Press, 1991)).

Hefner acknowledges the difficulty in adequately describing the relationship between genes and culture, however he supports the symbiosis model proposed by Ralph Burhoe.¹⁰⁷ He also commends Gerd Theissen’s interpretation of biblical faith through the lens of Burhoe’s model as a proposal for cultural evolution that transcends certain biological constraints.¹⁰⁸ Furthermore, Hefner argues that this complex gene-culture symbiosis that is the contemporary human has emerged from a deterministic evolutionary process as truly free – a freedom “rooted in the genetically controlled adaptive plasticity of the human phenotype”.¹⁰⁹ Yet this freedom exists in tension with conditions that are “suitable for the emergence of values”, reinforced through the evolutionary context in which they were fashioned.¹¹⁰ The two-natured character of human beings is antithetical to dualism, contends Hefner, as both streams of information have emerged from the one process of nature.¹¹¹

Hefner suggests that this hypothesis is tested and supported by a large body of relevant scientific literature. Indeed, this is possibly the most straightforward of Hefner’s hypotheses when it comes to testing. A wealth of studies demonstrate the influence of cultural factors on our biological function and vice versa. Cultural food options tend to conform to preferences influenced by genetically predisposed nutritional requirements – which explains why many prefer the taste of foods high in sugar, fat and salt. Conventional evolutionary theory has been expanded to include the phenomena known as “niche construction” – the ability of organisms to modify sources of natural selection within their environment. According to Laland et al., “culture amplifies the capacity of human beings” for niche construction.¹¹² Lactose digestion is an oft-cited example, with genetic mutations producing lactase

107. Hefner, *THF*, 30; c.f. Ralph Burhoe, “Religion’s Role in Human Evolution: The Missing Link between Ape-Man’s Selfish Genes and Civilized Altruism,” *Zygon* 14 (1979).

108. Hefner, *THF*, 30; c.f. Gerd Theissen, *Biblical Faith: An Evolutionary Approach* (Fortress Press, 1985).

109. Hefner, *THF*, 30. On this point Hefner refers us to Dobzhansky, *The Biological Basis of Human Freedom*.

110. Hefner, *THF*, 31.

111. *ibid.*, 102.

112. Kevin Laland, John Odling-Smee, and Marcus Feldman, “Niche Construction, Biological Evolution, and Cultural Change,” *Behavioral and Brain Sciences* 23 (2000), 131.

persistence beyond weaning increasingly distributed among particular populations since the beginning of animal domestication.¹¹³

Similarly, the cultural activity of yam cultivation in West Africa has been associated with an increased occurrence of the sickle cell anaemia gene in the local population, offering protection against the higher risk of malaria that comes with yam cultivation. Laland et al. do point out, however, that this is not direct causation by the cultural variable but rather the ecological variable of standing water is exerting selection pressure. They propose a particular model of gene-culture coevolution in which

instead of being exclusively responsible for allowing us to codirect our own evolution, in contrast to what happens in every other species, culture now becomes merely the principal way in which we humans do the same thing that most other species do.¹¹⁴

Various molecular signatures likely generated by cultural selection pressures have been identified in the human genome, with calls for cross-disciplinary studies to illuminate further the evolutionary relationship between genes and culture.¹¹⁵ More recently, insights from the field of epigenetics (which was in its infancy at the time of *The Human Factor*'s publication, therefore it is unsurprising that Hefner only briefly mentions it) have improved our evolutionary models and afforded a place to environmental factors (some of which are cultural) in inheritable characteristics.¹¹⁶ Novel patterns of brain waves have emerged since the increased usage of smartphones and other handheld internet devices, we can only speculate as to whether and how soon such changes will be reflected in the genome.¹¹⁷ Therefore, although there are more nuanced understandings available, it does seem evident that Hefner's

113. Pascale Gerbault et al., "Evolution of Lactase Persistence: An Example of Human Niche Construction," *Philosophical Transactions of the Royal Society B: Biological Sciences* 366 (2011), 863.

114. Laland, Odling-Smee, and Feldman, "Niche Construction, Biological Evolution, and Cultural Change", 137.

115. Kevin Laland, John Odling-Smee, and Sean Myles, "How Culture Shaped the Human Genome: Bringing Genetics and the Human Sciences Together," *Nature Reviews Genetics* 11 (2010), 146.

116. Michael Skinner, "Environmental Epigenetics and a Unified Theory of the Molecular Aspects of Evolution: A Neo-Lamarckian Concept that Facilitates Neo-Darwinian Evolution," *Genome Biology and Evolution* 7, no. 5 (2015).

117. Mari Swingle, *I-Minds: How Cell Phones, Computers, Gaming, and Social Media are Changing Our Brains, Our Behavior, and the Evolution of our Species* (New Society Publishers, 2016), 63.

hypothesis concerning the human as a gene-culture symbiont is supported by scientific accounts of coevolution.

Core Element 3

The final core element that Hefner outlines within the created co-creator hard core elaborates on the freedom that exists in tension with conditionedness.

The freedom that marks the created co-creator and its culture is an instrumentality of God for enabling the creation (consisting of the evolutionary past of genetic and cultural inheritance as well as the contemporary ecosystem) to participate in the intentional fulfillment of God’s purposes.¹¹⁸

This freedom is itself chosen by the creation, and means that the world is defined not by its past or present but rather by what it is becoming.¹¹⁹ The understanding of freedom is therefore eschatological. When it comes to the participation of the creation in God’s purposes, and the human role in this, Hefner understands the doctrine of the *imago Dei* to mean that “humans can be the vehicle for grace toward the creation”.¹²⁰ Associated with this core element are three further auxiliary hypotheses.

Hypothesis 7

The challenge that culture poses to human being can be stated thus: Culture is a system of information that humans must construct so as to adequately serve the three tasks of interpreting the world in which humans live, guiding human behavior, and interfacing with the physico-biogenetic cultural systems that constitute the environment in which we live.¹²¹

This hypothesis carries a great deal of weight for the entire theory according to Hefner.¹²² He points out that “whatever the human being acts out culturally fully implicates the genetic and ecosystem symbionts”.¹²³ Yet “culture is also always

118. Hefner, *THF*, 45.

119. *ibid.*, 46.

120. *ibid.*, 238.

121. *ibid.*, 48.

122. *ibid.*, 49.

123. *ibid.*, 47.

seeking to stretch genes and ecosystem in order to fulfill what seems from the cultural perspective to be desirable and useful novel ends.”¹²⁴

Hefner again refers us to the scientific literature for the testing of this hypothesis. He argues that neuroscientific evidence “supports the notion that our biogenetic equipment as human beings is built to sustain the formation of culture”.¹²⁵ He gives the example of the comparatively premature birth of human offspring compared with other species; the skull continues to grow long after birth in order to develop the neurological equipment necessary for culture.¹²⁶

A potential falsifier for this hypothesis would be the existence of a group of humans with no identifiable culture, who are still able to carry out Hefner’s identified tasks of interpretation, guidance of behaviour, and interaction with the environment. No known example exists, which appears to support the hypothesis. Yet the hypothesis is constituted by multiple claims. The claim that culture is constructed by humans is well-attested by the scientific literature. Popper, for example, distinguished the cultural world – “the products of the human mind” – from the physical world.¹²⁷

The purpose of culture is less straightforward. Anthropologist Clifford Geertz would agree with Hefner, defining culture as “the fabric of meaning in terms of which humans interpret their experience and guide their action”.¹²⁸ Psychological explorations of culture have spoken of its function as an evolutionary adaptation.¹²⁹ While scientific research into the purpose of culture remains fairly scant (and this largely seems to be carried out by human scientists, garnering less interest among physical scientists), further developments in the field may support Hefner’s

124. Hefner, *THF*, 47.

125. *ibid.*, 163. This he relates back to the previous hypothesis that humans are gene-culture symbionts.

126. *ibid.*, 163-164.

127. Karl Popper, *Objective Knowledge: An Evolutionary Approach* (Clarendon Press, 1972), chapter 4.

128. Clifford Geertz, *The Interpretation of Cultures: Selected Essays* (Basic Books, 1973), 144-145.

129. See for example Jerome Barkow, Leda Cosmides, and John Tooby, *The Adapted Mind: Evolutionary Psychology and the Generation of Culture* (Oxford University Press, 1992); Darrin R. Lehman, Chi-yue Chiu, and Mark Schaller, “Psychology and Culture,” *Annual Review of Psychology* 55, no. 1 (2004), 691.

hypothesis, to the extent that its claims can be considered scientific ones. At the very least, it has not been falsified by existing scientific data.

Hypothesis 8

We now live in a condition that may be termed technological civilization. This condition is characterized by the fact that human decision has conditioned virtually all of the planetary physico-biogenetic systems, so that human decision is the critical factor in the continued functioning of the planet’s systems.¹³⁰

Essentially, all natural systems are now affected by the human cultural overlay – there are no longer any locations completely untouched by human decision.¹³¹ Again, human freedom is emphasised in this hypothesis. The created co-creator is the agent in technological civilisation, recognising it to be the form of the natural world “commensurate with their particular epoch in evolutionary history”.¹³²

There are two parts to this hypothesis – the pervasion of technology globally and the critical role accorded to humans for the planet’s future. With respect to the first, there is strong scientific corroboration for what Hefner describes as the cultural overlay of natural systems. The beginning of the millennium saw a coordinated effort to consider the present environmental conditions at the global level, with the United Nations Environment Program reporting the pervasive impact of human activity on the natural environment.¹³³ More recent reports from the Intergovernmental Panel on Climate Change (IPCC), which reviews, evaluates and synthesises the latest scientific research on climate change, offer a sobering assessment of the vulnerability of various natural systems – largely as a result of human activity.¹³⁴ Scientists continue to argue this point, with polar researcher Peter Wadhams capturing eloquently one example of this human impact on the natural world in his comments on the diminishing polar icecaps:

130. Hefner, *THF*, 49.

131. *ibid.*, 153.

132. *ibid.*, 155.

133. United Nations Environment Program, *Global Environment Outlook 2000* (Earthscan, 2000).

134. Intergovernmental Panel on Climate Change, *Climate Change 2014: Impacts, Adaptation, and Vulnerability* (Cambridge University Press, 2014).

Our planet has actually changed colour. We all remember the first beautiful photograph of planet earth rising from behind the Moon, taken by the Apollo-8 astronauts, a delicate blue sphere, isolated in the cosmos, which contains all that we know of life. That sphere was white at both ends. Today, from space, the top of the world in the northern summer looks blue instead of white. We have created an ocean where there was once an ice sheet. It is Man's first major achievement in reshaping the face of his planet, and it is of course an unintended achievement, with dubious and possibly catastrophic consequences to follow.¹³⁵

The second part of the hypothesis concerns the centrality of humans for determining the planet's future. Again, many scientists would agree with Hefner's premise. The plethora of international climate conventions and agreements, as well as growing research into sustainable technologies, suggests that the majority of scientists and policy developers at least operate under the assumption that human action plays a critical role. Sociobiologist E. O. Wilson recently published what can only be described as a desperate plea for humans to exercise their decisive capacity in order to avert global environmental catastrophe.¹³⁶ Sir John Houghton, atmospheric physicist and previous chair of the IPCC, urges us to take our environmental stewardship responsibilities seriously as we consider the impact of our actions now and in the future.¹³⁷

Hefner's identification of the current global situation as a technological civilisation, in which human decision is decisive, is expressed in neutral terms. It could be argued, however, that the way to foster the wholesomeness of non-human creation is to reduce the impact of human activity on the rest of nature. We see this frequently today in the language of environmental advocacy groups calling for a reduction in our "ecological footprint" – possibly this framing of the problem is more helpful than simply drawing attention to the centrality of human agency.

Whether this hypothesis makes sense of novel facts, a key idea of the Lakatosian model, or merely explains data already available to Hefner at the time of writing

135. Peter Wadhams, *A Farewell to Ice* (Allen Lane, 2016), 2-3.

136. Edward O. Wilson, *Half-Earth: Our Planet's Fight for Life* (Liveright Publishing, 2016).

137. John T. Houghton, *Global Warming: The Complete Briefing* (Cambridge University Press, 2015), 357.

is another question.¹³⁸ As it continues to be corroborated by up-to-date research in the interaction of technology and the environment, however, this hypothesis may be considered validated by scientific knowledge.

Hypothesis 9

Myth and ritual are critical components of the cultural system of information and guidance. They are marked in linguistic form by declarative or imperative discourse, and their concepts are vastly underdetermined by the data of evidence. In light of human evolutionary history, these marks were necessary if culture was to serve its evolutionary function.¹³⁹

In this final hypothesis, Hefner elaborates on the role of myth and ritual, speculating that they are the chief carriers of cultural information that both motivates and interprets human behaviour beyond the purely physiological.¹⁴⁰ In agreement with Paul Ricoeur he affirms the intrinsic meaning of myth and ritual.¹⁴¹ He describes their relation to each other, and to praxis: “myth portrays reality, ritual presents symbolically the action that reality requires, while praxis translates the ritual into ordinary, everyday living”.¹⁴² He considers fruitful Julian Jaynes’ proposal that over three thousand years ago the human mind functioned bicamerally, with the informed right hemisphere of the brain “speaking” commands to the left (such commands were heard and interpreted as the voice of the gods).¹⁴³ Though he resists a completely adaptationist account of myth and ritual, he considers them facilitators for imprinting information.¹⁴⁴

Hefner suggests that this last hypothesis is highly speculative and “has no possibility of being tested in a scientific manner”.¹⁴⁵ However, it can be scrutinised

138. Here, Murphy’s critique of Hefner’s “fuzzy” interpretation of novel facts becomes relevant. See footnote ??.

139. Hefner, *THF*, 49.

140. *ibid.*, 149.

141. *ibid.*, 151.

142. *ibid.*, 156.

143. *ibid.*, 163; c.f. Julian Jaynes, *The Origin of Consciousness in the Breakdown of the Bicameral Mind* (Houghton Mifflin, 1977).

144. Hefner, *THF*, 171–172; c.f. John Pfeiffer, *The Creative Explosion: An Enquiry into the Origins of Art and Religion* (Cornell University Press, 1982), 227–228; Mihaly Csikszentmihalyi, *Tomorrow’s Mind* (HarperCollins, 1993).

145. Hefner, *THF*, 49.

for blatant scientific errors.¹⁴⁶ Hefner concedes that we have no conclusive evidence when it comes to the evolutionary origins of ritual or myth, suggesting they are underdetermined by data.¹⁴⁷ The non-scientific nature of this hypothesis does not invalidate its potential fruitfulness, but it does not comply with Hefner's stated aim of articulating falsifiable hypotheses.¹⁴⁸ Perhaps the inability of this hypothesis to be properly tested lies with the contemporary human stance toward the nature and reality of myth. Hefner traces the history of how humans have understood myth, from a premodern position of naive realism, through the Enlightenment debunking of myth using critical reason, to the simultaneous deconstruction and affirmation of myth – “we believe in myth under the conditions of *irony*.”¹⁴⁹

Hefner does cite research suggesting that the human central nervous system has “mythopoeic requirements” (Wilson's phrase) for ordering the information at its disposal.¹⁵⁰ A more explicit scientific proposal is offered by Jaynes, which Hefner approves but also acknowledges to be speculative (and eccentric). With respect to Jaynes' theory of bicameral brain functioning, the scientific jury is still out. The theory has been controversial since its inception, however it has been suggested that neuroimaging studies support Jaynes' hypothesis.¹⁵¹

The underdetermination of myth represents no problems for Hefner with respect to its unfalsifiability – the very nature and function of myth in evolutionary history requires action prior to the gathering of data that could support or falsify it.¹⁵² Hefner does point out, however, that this hypothesis rejects the possibility that humans could have survived this long without the information provided by myth and ritual.¹⁵³ A potential falsifier may therefore be the existence of human culture

146. Hefner, *THF*, 49.

147. *ibid.*, 159, 202.

148. *ibid.*, 25.

149. *ibid.*, 187, emphasis original.

150. *ibid.*, 185. The works cited by Hefner include Charles Laughlin, John McManus, and Eugene d'Aquili, *Brain, Symbol and Experience: Toward a Neurophenomenology of Human Consciousness* (Columbia University Press, 1990); Edward O. Wilson, *On Human Nature* (Harvard University Press, 1978).

151. Leo Sher, “Neuroimaging, Auditory Hallucinations, and the Bicameral Mind,” *Journal of Psychiatry and Neuroscience* 25, no. 3 (2000), 240.

152. Hefner, *THF*, 204.

153. *ibid.*, 267.

that does not possess any form of myth or ritual – and no examples have been discovered thus far. Despite this, the inability to specify how this hypothesis might be corroborated scientifically suggests that Hefner’s characterisation of it as speculative and non-scientific holds.

3.2 Theological Coherency

A sign of a successful research programme according to Lakatos is its ability to generate novel insights. As part of his positive heuristic Hefner reformulates several traditional Christian doctrines in accordance with contemporary scientific knowledge, and these are worth examining before we come to an evaluation of Hefner’s proposal in terms of a Lakatosian framework. In view of their relevance to the present research, which seeks to locate a treatment of human creativity within a theology of creation, Hefner’s revisions of the doctrines of God, sin and evil are considered briefly here.

Doctrine of God

Hefner suggests that our present concepts of God are conditioned by past understandings of nature that are no longer held to be scientifically valid.¹⁵⁴ In Hefner’s theological model he proposes a conception of God that takes into account more recent scientific insights into nature. Hefner follows Paul Tillich’s conception of God as the “name for that which concerns us ultimately”.¹⁵⁵ Additionally, he draws parallels between the function of the term *God* and the function of metaphysics for Alfred North Whitehead.¹⁵⁶ *God* has a threefold meaning: “objective reality, transforming experience, and internal mental construct”.¹⁵⁷

Hefner’s understanding of God carries over into his view of how we should speak about God. “God-talk should be viewed as expressing something about our experience of a world that is scientifically understood.”¹⁵⁸ “God-talk”, for Hefner,

154. *ibid.*, 82.

155. *ibid.*, 32; c.f. Paul Tillich, *Systematic Theology*, vol. 1 (University of Chicago Press, 1951), 211f.

156. Hefner, *THF*, 91.

157. *ibid.*, 91.

158. (*ibid.*, 81).

becomes a tool for speaking of ultimate reality. He reads the Sermon of the Mount as an example of Jesus using the tool of God-talk to establish the coherence of human experience in the world, presenting a vision for human life “fully in accord with the fundamental nature of reality.”¹⁵⁹

While Hefner locates himself within the Christian tradition, and is largely happy to operate within that sphere, he takes a universalist approach to other religions, pointing out that they have “stood the same test of history and selection as Christianity has”.¹⁶⁰ He also articulates what he considers the scientific equivalent of the Christian notion of God’s prior love for the creation:

The reality system of nature in which we live is itself basically an ambience in which we truly belong, an ambience that has brought us into being, and that enables us to fulfill the purposes for which we were brought into being. The central reality that undergirds all of our concrete experience and to which we continually seek to adapt is disposed toward us in a way that we can interpret as graciousness and beneficent support.¹⁶¹

Hefner’s understanding of the Trinity, which he describes as “an authentic attempt to engage in world-view construction on the basis of Christian faith”,¹⁶² is informed by process thought.¹⁶³ He concludes from the doctrine of the Trinity that “Christian theology has wanted to make the career of God and that of the world inseparable.”¹⁶⁴ Hefner diverges from traditional understandings of the work of the Trinity in ascribing the work of both creation and redemption exclusively to the Second Person.¹⁶⁵ In this respect, his grounding of human creativity in the doctrine of the *imago Dei* differs significantly from Sayers’ and Maritain’s trinitarian approaches.

Sin and evil

An understanding of humans as “created co-creator” leads Hefner to an interpretation of sin that is also at odds with traditional notions. Hefner displays an apparent

159. Hefner, *THF*, 86.

160. *ibid.*, 194.

161. *ibid.*, 194.

162. *ibid.*, 234; c.f. Hefner, “The Foundations of Belonging”.

163. The influence of process theology on Hefner’s work will be considered in the next chapter.

164. Hefner, “The Foundations of Belonging”, 169.

165. *ibid.*, 169.

aversion to the term “sin”. He refers to “the confusion and out-of-kilteredness between humans and the rest of nature.”¹⁶⁶ He reads the imagery of Genesis as a myth that expresses this “out-of-kilteredness.”¹⁶⁷ Certainly Hefner rejects some notions concerning sin, such as a historical first pair and fall and the transmission of sin via concupiscence.¹⁶⁸ He favours instead “traditions that speak of intrinsic infallibility and weakness in the very constitution of *Homo sapiens*.”¹⁶⁹ He is also skeptical of concepts of original sinlessness, arguing that the “symbol of primeval blessedness in the garden” indicates a grounding of human being in ultimate reality, a consequence of it being created by God.¹⁷⁰

Hefner follows the likes of Ralph Burhoe and Donald Campbell in his understanding of original sin as “the inherent conflict within us between the information inherited from our prehuman evolutionary past that governs our genetic constitution and the cultural information that our brains make possible”.¹⁷¹

The origin of the myths, philosophy, and theology of sin and evil, lies in the primordial human reading of the world and our place in it. Their importance lies in their being part of viable information systems that not only served human understanding, but also human survival.¹⁷²

The language of the above quote comes close to suggesting that religion is an evolutionary adaptation. Hefner understands the traditional theological concepts of the fall and original sin to be “mythic renditions” of the biologically grounded sense of discrepancy between the prehuman components of our central nervous system and the more recently developed higher functions.¹⁷³ He similarly locates our sense of guilt in the denial of our primitive motivators (which tend to be connected with pleasure responses).¹⁷⁴ He refers to the “turmoil” that may result when the

166. Hefner, *THF*, 67.

167. *ibid.*, 68.

168. *ibid.*, 139–140.

169. *ibid.*, 225.

170. *ibid.*, 240.

171. *ibid.*, 68; c.f. Ralph Burhoe, *Toward a Scientific Theology* (Christian Journals, 1981), 65, 201–28; Donald Campbell, “The Conflict Between Social and Biological Evolution and the Concept of Original Sin,” *Zygon* 10 (1975); Donald Campbell, “On the Conflicts Between Biological and Social Evolution and between Psychology and Moral Tradition,” *Zygon* 11 (1976).

172. Hefner, *THF*, 125.

173. *ibid.*, 132.

174. *ibid.*, 133.

two natures of the human are not in harmony.¹⁷⁵ He draws on Burhoe's description of the "divided will at war with itself – a living hell – in those brains when and where culturetype and genotype are not suitably coadapted."¹⁷⁶ Guilt is a human predisposition "because of the broad range of evolutionarily originated information that it carries within it, whose expectations it cannot or will not fulfill".¹⁷⁷

The understanding of evil undergoes a similar modification at the hands of Hefner's research programme. Hefner attributes the *incurvatus in se* of the tradition to the susceptibility of humans and human culture to be deceived as to the true nature of reality.¹⁷⁸ While Hefner does not include it in his own Lakatosian explication of the "created co-creator", he suggests that John Hick's proposal that "evil is the unavoidable accompaniment of the kind of natural system that is required if freedom and personhood are to emerge" serves as an additional auxiliary hypothesis.¹⁷⁹ Though Hefner relegates theodicy to the hard core of his programme, he identifies a starting point for testing in Hick's work.¹⁸⁰ The understanding of evil, for Hefner, is a major point on which any worldview must stand or fall.¹⁸¹

A discussion of sin and evil naturally directs us to the topic of morality. Hefner often uses the term "error" in conjunction with the failure of humans to fulfil our task as created co-creator. He singles humans out from other creatures for our capacity to negotiate the natural laws as we observe them, yet acknowledges that "we are more negotiators, we have not understood what proposals we ought to make."¹⁸²

Hefner accepts the view that morality is grounded in our evolutionary history.¹⁸³ "Prehuman components are active within us... still engaged in the ongoing struggle to learn how to function in a way that is appropriate to their human context."¹⁸⁴

175. Hefner, *THF*, 118.

176. *ibid.*; c.f. Burhoe, *Toward a Scientific Theology*, 126.

177. Hefner, *THF*, 240.

178. *ibid.*, 240.

179. *ibid.*, 271; c.f. John Hick, "An Irenaean Theodicy," in *Encountering Evil*, ed. Stephen Davis (John Knox, 1981).

180. Hefner, *THF*, 271.

181. Hefner, "The Foundations of Belonging", 166.

182. Hefner, *THF*, 67.

183. *ibid.*, 178.

184. *ibid.*, 179; c.f. Anthony Stevens, *Archetypes: A Natural History of the Self* (Morrow, 1983), 267–271.

Values and morality emerged along with freedom.¹⁸⁵ In his understanding of human morality Hefner draws on the work of William Irons, Richard Alexander, and Donald Campbell. The imposition of cultural obligations, through the establishment of social contracts, allows us to counter the impulses of our “selfish” genes.¹⁸⁶

He equates the love command of the Judeo-Christian tradition with the trans-kin altruism described by Ralph Burhoe – beneficent behaviour towards others even though they may not be genetically related.¹⁸⁷ Yet theology, in Hefner’s view, suggests that the scientific explanations for altruism are inadequate by themselves; we need alternative means for grounding the value of altruism in the fundamental reality.¹⁸⁸ These means are provided through religious myths.¹⁸⁹ The biblical references containing the imperative to love the other (Mt 5:43–38; 22:37–40; Jn 13:34) are interpreted by Hefner as assertions that love (which includes, but extends beyond, altruism) is intrinsic to human nature, grounded in “the way things are” by the contextualising Christian narrative from which the love command is derived.¹⁹⁰ Scientific claims are integrated into his argument, thus “the assumption that the emergence of natural structures and processes is not in vain is [Hefner’s] way of affirming God and also showing what difference it makes to introduce God into the discussion”.¹⁹¹

Hefner’s treatment of the doctrine of God, and of sin, are not articulated explicitly for the purpose of locating human creativity within a broader doctrine of creation. His work is not incompatible with such a move, however he has very much focused on incorporating knowledge of human evolutionary history into his theological anthropology, rather than attempting a theological justification of the way in which human creating resembles the divine.

185. Hefner, *THF*, 179–180.

186. *ibid.*, 181–182. Hefner, as well as the thinkers he draws from, are responding to the notion of the selfish gene as articulated by Richard Dawkins.

187. *ibid.*, 197.

188. Hefner does articulate a form of moral realism, grounding values in “the fundamental character of reality” (*ibid.*, 188).

189. *ibid.*, 197.

190. *ibid.*, 207–208.

191. *ibid.*, 59.

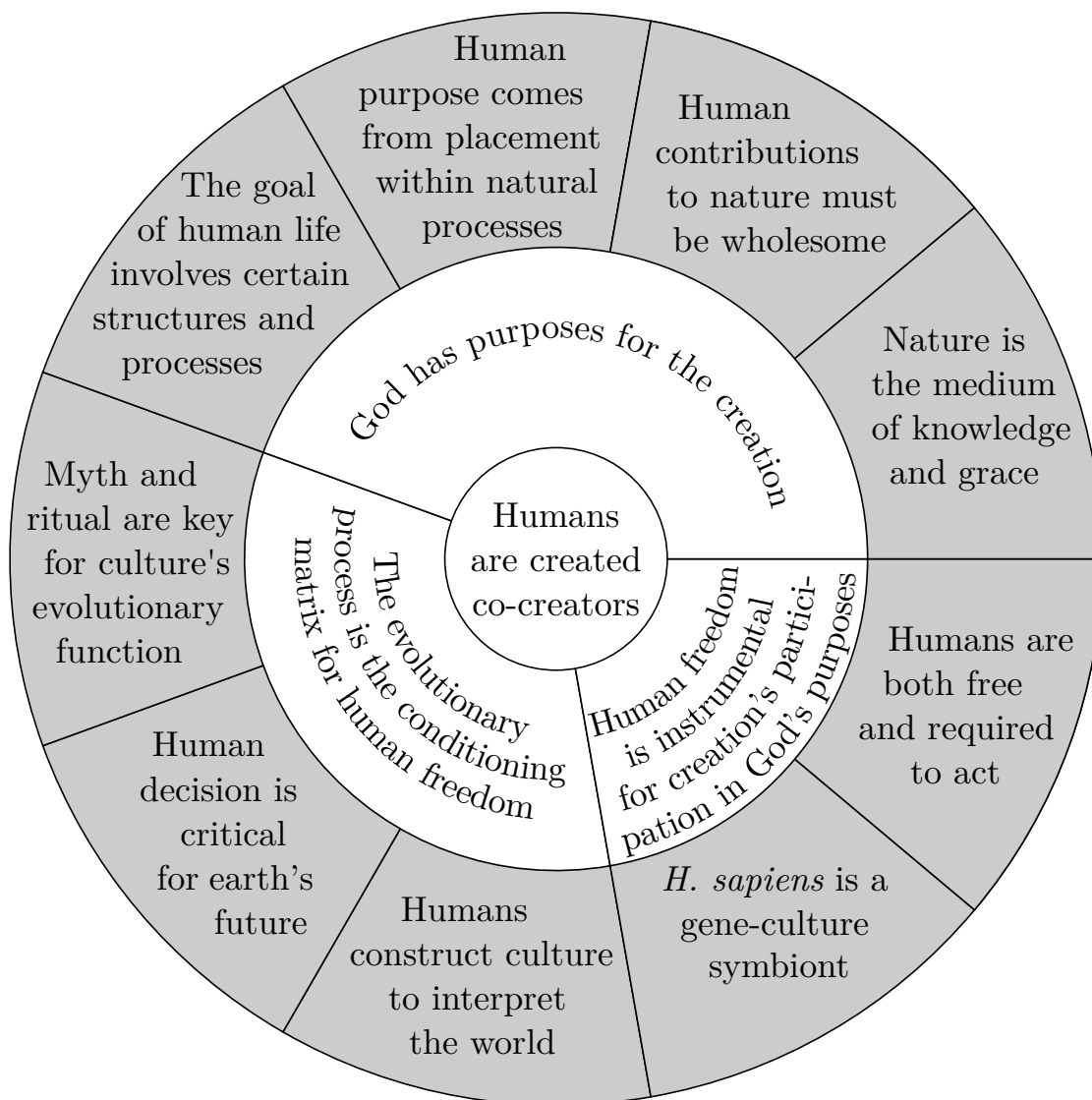


Figure 3.1: A schematic summary of Hefner's hard core and its constituent elements (white) surrounded by the protective belt of auxiliary hypotheses (grey).

3.2.1 How Lakatosian is the Created Co-Creator Model?

Having examined Hefner's created co-creator more closely (represented diagrammatically in Figure 3.1), and its implications for certain doctrines, we now return to the methodological framework that undergirds his model. How faithful is his theological construction to the Lakatosian structure he aims to employ?

It should be mentioned at the outset that Hefner does acknowledge the difficulty

of defining falsification in a theological context.¹⁹² In many instances, he would replace the stricter scientific notion of falsification with the softer criteria of amenability to public discussion.¹⁹³ Hefner acknowledges his own “methodological opaqueness”, which he considers a product of his context – while writing *The Human Factor* he was working both in the instruction of Lutheran ordinands and in academic engagement with many working in scientific disciplines.¹⁹⁴ Robert Russell, writing more generally on the theological appropriation of Lakatosian methodology, suggests that

Theological explanations are subject to validation not by verificationist/foundationalist standards, but by intersubjective testability and universalizability, as performed by the disciplinary community.¹⁹⁵

While this does offer a helpful redefinition of theory validation within the theological context, it is not clear that Hefner adopted any such view, and Russell’s own reconfiguration comes several decades after the peak period of theological engagement with Lakatosian methodology.

At the close of *The Human Factor*, Hefner offers his own evaluation of how successful the created co-creator model is as a Lakatosian research programme. He identifies a number of novel facts associated with his model, including the referral of human meaning to nature, the emphasis on teleonomy when it comes to humans, the inclusion of the biocultural evolutionary model into his theological anthropology, more complex conceptualisations of freedom and determinism, the integration of technology into evolution and human nature, the conceptual role afforded to myth and ritual within culture, and the identification of evil and theodicy as potential falsifiers.¹⁹⁶ He also considers his various doctrinal reinterpretations to comprise novel facts, including the relation of nature to grace, the purpose of human existence, and his definitions of atonement, justification, and original sin.¹⁹⁷

192. Hefner, *THF*, 25.

193. *ibid.*, 24.

194. *ibid.*, xvi.

195. Robert Russell, “Ian Barbour’s Methodological Breakthrough: Creating the “Bridge” Between Science and Theology,” *Theology and Science* 15, no. 1 (2017), 33.

196. Hefner, *THF*, 268–271. It bears reminding that much of this depends on Hefner’s redefinition and expansion of Lakatos’ concept of novel facts, which Murphy questioned (as mentioned above).

197. *ibid.*, 272–275.

Whether any of Hefner's doctrinal reinterpretations are truly novel is questionable, though they of course meet his definition of novel. The present work has only considered a few of Hefner's theological commitments, although it is likely that his reframing of certain doctrines falls outside what is generally considered theologically orthodox. There appears to be a dissonance between some of Hefner's theological conclusions and his claim that one of the responsibilities of theology is to "preserve the Christianness of its statements".¹⁹⁸ A probing of other doctrinal implications is likely to yield further questions concerning the theological significance of Hefner's created co-creator model, however such an investigation is beyond the scope of this work.

When it comes to scientific corroboration, several of Hefner's auxiliary hypotheses do appear to hold up against scientific knowledge that has arisen since Hefner's formulation. Though comparative morphology is not a new discipline, the discovery of the polymerase chain reaction (PCR) technique for the amplification of DNA in the 1990s has allowed the extension of morphological studies to include traits at the molecular level.¹⁹⁹ Along with increasingly sophisticated bioinformatic tools, this has made a vast difference to the field of phylogenetics, which maps the relationships and evolutionary history of the various species. These developments have only confirmed Hefner's argument in the first auxiliary hypothesis that humans will exhibit continuity with the rest of nature in the realm of structures and processes.²⁰⁰ Similar arguments could be made for the ongoing corroboration of Hefner's hypothesis concerning the interplay of culture and genes and the predisposition of the human mind toward narrative construction.

198. Hefner, *Faith and the Vitalities of History*, 183. Quite what he means by "Christianness" is unclear.

199. Rafael Zardoya and Axel Meyer, "Molecular Evidence on the Origin of and the Phylogenetic Relationships Among the Major Groups of Vertebrates," in *Evolution: From Molecules to Ecosystems*, ed. Andrés Moya and Enrique Font (Oxford University Press, 2004), 209–210. See, for example, Thierry Backeljau et al., "Random Amplified Polymorphic DNA (RAPD) and Parsimony Methods," *Cladistics* 11 (1995). Note that molecular analyses are distinct from comparative morphology in that they do not concern observable characteristics (Ridley, *Evolution*, 425).

200. Hefner does mention nucleotide sequence comparisons, but the technology has advanced considerably since publication in 1993 (Hefner, *THF*, 65).

As argued in the previous section, however, not all of Hefner’s hypotheses are scientifically valid. Of the nine hypotheses put forward by Hefner, only three could be considered falsifiable by scientific data (hypotheses six, seven and eight). The remaining hypotheses all make claims extending beyond that which could be scientifically falsified – Hefner himself points out that his last hypothesis is incapable of being subjected to scientific testing.²⁰¹ Though the three hypotheses formulated sufficiently to be scientifically falsifiable appear to be supported by current scientific knowledge, this hardly constitutes a successful Lakatosian research programme. Within the assumptions of the Lakatosian framework, the majority of Hefner’s auxiliary hypotheses would require substantial reconfiguration (and it is questionable whether this is even possible) to reasonably protect his hard core.

But should a successful Lakatosian research programme be the goal? Perhaps in claiming scientific falsifiability for his theological statements, Hefner does theology (and epistemology more generally) a disservice. His many caveats notwithstanding, Hefner appears to have bought into the modernist privileging of scientific explanation above all other aspects of knowing. Peter Hacker expresses the problem well:

Every source of truth is also unavoidably a source of falsehood, from which its own canons of reasoning and confirmation attempt to protect it. But it can also become a source of conceptual confusion, and consequently of forms of intellectual myth-making, against which it is typically powerless. Scientism, the illicit extension of the methods and categories of science beyond their legitimate domain, is one such form, and the conception of the unity of the sciences and the methodological homogeneity of the natural sciences and of humanistic studies one such myth. It is the task of philosophy to defend us against such illusions of reason.²⁰²

The intent to explain theology in scientific terms is vulnerable to Hacker’s “illusions of reason”. Yet is Hefner really so unaware of this danger? He acknowledges the limits to science, especially in later works. For example, he writes that “science must learn from religion that even though the ships that science builds are huge

201. *ibid.*, 49.

202. Peter Hacker, *Wittgenstein: Connections and Controversies* (Oxford University Press, 2001), 73.

and impressive, the sea is even bigger and rougher.”²⁰³ He insists that science can raise questions which cannot themselves be resolved using scientific reasoning.²⁰⁴ It seems that the critique offered of Lakatos earlier, that his model does not sufficiently account for the contextual character of scientific enquiry, does not then apply to Hefner, or at least not to the same extent. Revisiting his epistemological commitments, Hefner allows that knowledge is conditioned, pointing out that “we can neither understand nor participate in the ongoing life of faith and theology apart from the mediation of social reality”.²⁰⁵ Ultimately Hefner acknowledges the limitations of methodology, his verdict approaching the poetic: “Like a twig caught in the raging current of a storm-roiled river, the fruits of the method are more in the realm of hope than of certainty.”²⁰⁶

Despite the methodological insufficiencies in Hefner’s approach to scientific knowledge, his created co-creator model is largely compatible with the findings of contemporary science. Perhaps Hefner’s transgression is not that he reduces theology to scientific explanations, but rather that he gives the impression that such a move can be performed. Hefner’s model is actually far richer than a scientific account alone could provide. He makes claims about human nature and reality that, while not contravened by scientific knowledge, are not evident without recourse to nonscientific sources of knowledge. That Hefner misrepresents his work is unlikely a conscious deception, and we can reasonably attribute to him the best of intentions in the project of harmonising theology and science. Ultimately, however, we can learn from Hefner’s example that theology suffers when scholars attempt to reduce it to scientific explanations. The methodological strictures of the sciences that allow them to perform scientific tasks so successfully also prevent them from offering a complete anthropology. As Peterson contends, “a full, genuine (theological) anthropology must necessarily take the soteriological risk, to which the sciences can only incompletely

203. Philip Hefner, “Spiritual Transformation and Healing: An Encounter with the Sacred,” in *Spiritual Transformation and Healing: Anthropological, Theological, Neuroscientific, and Clinical Perspectives*, ed. Joan Koss-Chioino and Philip Hefner (Altamira Press, 2006), 130.

204. Hefner, *THF*, 147.

205. Philip Hefner, “The Cultural Significance of Jesus’ Death as Sacrifice,” *Journal of Religion* 60, no. 4 (1980), 427.

206. Hefner, *THF*, 152.

contribute”.²⁰⁷ It is the fundamental commitments concerning ultimate reality that allow Hefner’s model to make sense of insights from the natural world.

This critique does not negate the potential value of the created co-creator metaphor when deliberating the use of technology. An affirmation of the extra-scientific metaphysical commitments involved may give the position more worth in the eyes of many theologians (and scientists!), and the scientific commensurability of many elements recommends the model for communication in a pluralistic context. Such a synthesis of scientific and theological content provides a far more convincing response than an account derived from either scientific sources or sources more traditional for theological construction (e.g. Scripture) alone. Hefner does appear to have shifted in his views over time, referring a decade later to the created co-creator as a “diagnostic idea” that “interprets ordinary existence”.²⁰⁸ He is content to summarise his construction as “the common experience that we are able to do things that are novel; that we are able to change the world around us and the world within us in ways that seem important and desirable”.²⁰⁹

Hefner’s model may also be refined and nuanced if combined with more recent developments in the area. Deacon’s account of emergence has already been offered as a more robust attempt to understand human freedom and self-awareness in a non-reductionist framework. In recent years, Hefner has engaged with the scholarship of Donna Haraway. He suggests that Haraway’s cyborg and the created co-creator are sibling images. Even then, however, Hefner still insists on reducing createdness to “kinship with the processes that have created us”.²¹⁰ This sits in uneasy tension with his contention that “we cannot avoid the question of God, because we create as if it matters”.²¹¹ In his most developed exposition of the created co-creator, Hefner appears reluctant to bring his own theological convictions into his understanding of

207. Gregory Peterson, “The Created Co-Creator: What it Is and What it Is Not,” *Zygon* 39, no. 4 (2004), 839.

208. Philip Hefner, “The Created Co-Creator Meets Cyborg,” <http://www.metanexus.net/essay/created-co-creator-meets-cyborg>, 1.

209. *ibid.*, 2.

210. Philip Hefner, “Human Being: Questioning and Being Questioned,” *Zygon* 39, no. 4 (2004), 5.

211. *ibid.*, 7.

anthropology and the human future, yet ultimately cannot avoid doing so. More recently, looking back over his career in science and religion, Hefner offers an updated conception of the theologian's task: they are to reflect on findings of scientific research.²¹² Viewed through the lens of Hefner's later thought as to how science and religion relate to one another, which no longer includes reference to a criterion of falsification or to Lakatosian philosophy of science, many of the methodological concerns raised here with respect to Hefner's earlier work are alleviated.²¹³

3.3 The Created Co-Creator as a Response to Human Enhancement Issues

Acknowledging the potential refinements to Hefner's "created co-creator" model identified in the previous section, let us consider its usefulness as a theological response to transhumanism, and related questions of human enhancement. For a theology of human creativity to successfully engage these questions, it must offer both an openness to dialogue with scientific and technological thought and a robust account of the human imagination (as argued in the previous chapter).

3.3.1 Co-Creation and Technology

Garner believes Hefner's model is a useful starting point for engaging with transhumanism, particularly in light of the technological agency it accords to humans.²¹⁴ Hefner himself writes explicitly on transhumanism in a short article, though he mainly addresses more pervasive ideas of enhancement rather than the more extreme transhumanist philosophies.²¹⁵ His own understanding of how co-creation relates to human enhancement is perhaps best represented in his reflections on the imagery of God knitting the unborn in the mother's womb in Psalm 139, in conjunction with his own personal experience of physical impairment. The psalm

212. Philip Hefner, "Life in Religion-and-Science," *Theology and Science* 13, no. 1 (2015), 11.

213. *ibid.*

214. Garner, "Christian Theology and Transhumanism", 230–231.

215. Philip Hefner, "The Animal that Aspires to be an Angel: The Challenge of Transhumanism," *Dialog* 48, no. 2 (2009).

expresses my personal faith, and yet I am glad to have that knitting undone and redone, through the very human instrumentality of knowledge, skill, and ingenuity. I do not consider that original knitting to be sacrosanct in its details; it is not my unrevisable destiny – destiny, yes, but capable of editing and revision by human hands. One might even say that [transhumanism] partners with the God of psalm 139.²¹⁶

As the present research concerns the use and validity of human enhancement technologies, it is worth exploring further the place Hefner affords to technology within his framework. Alluded to briefly in his eighth auxiliary hypothesis, Hefner contends that technology is a phase of cultural evolution and locates it within evolutionary processes.²¹⁷ He thus refuses a dualism between nature and technology (or, by implication, nature and culture). Instead, technology is linked with both freedom and decision, a natural part of “the evolutionary process-become-aware itself”.²¹⁸ Technology is a therefore a form of nature and we must interpret its purpose by referring to the natural order from which it emerged.²¹⁹ In later work he reaffirms his view that neither culture nor technology are ontologically distinct from nature.

Nature has produced humans, and since it has decreed that they are cultural creatures, their nature is culture-nature. Technology, the product of culture, comes to be natural to humans.²²⁰

As technology is rolled into culture in Hefner’s work, it also worth revisiting what Hefner means by the term culture (discussed especially in his seventh auxiliary hypothesis). In Hefner’s words, “culture is defined as learned and taught patterns of behavior, together with the symbol systems that contextualize and interpret the behavior.”²²¹ Yet he speaks of culture as if it has an agency of its own e.g. it creates new conditions that bring about the stretching of genes and the ecosystem.²²² It is by culture that we “create the world views and mores that literally put our worlds together and tell us where we fit.”²²³ Culture is “the primary instrument by which

216. *ibid.*, 161.

217. Hefner, *THF*, 49.

218. *ibid.*, 49. Here we see echoes of Teilhard and Huxley.

219. *ibid.*, 154.

220. Hefner, “The Created Co-Creator Meets Cyborg”, 5.

221. Philip Hefner, “Biocultural Evolution and the Created Co-Creator,” in *Science and Theology: The New Consonance*, ed. Ted Peters (Westview Press, 1998), 175.

222. Hefner, *THF*, 47.

223. *ibid.*, 65.

humans act upon the rest of nature”.²²⁴ It is culture that allows for important brain learning to be “inherited” by subsequent generations, thus rendering human learning uniquely cumulative among animals.²²⁵

In conjunction with this conception of nature and culture, Hefner’s understanding of human freedom and its place in ultimate reality prompts him to define technology as “an expression of the fundamental self-transcending reality of God”.²²⁶ He perceives of technology as sacramental, arguing that “technological restlessness is a means of grace”.²²⁷ This extends his notion that each person is a sacrament, “an earthy human body living on the cusp of transcendence”.²²⁸ He affirms Teilhard’s mystic vision of the sacramental nature of the planet (which *is* the body of Christ) and human participation in this reality, suggesting that the use of technology is central to such participation.²²⁹

According to Hefner, technology serves as a mirror, reflecting back to us our human desires.²³⁰ It reveals our finitude, frailty and mortality, as well as our desire to overcome these limitations.²³¹

Simply by being there, technology of all kinds expresses the truth that we need technical assistance in order to become who and what we want to be, because our finitude does not carry us as far as we want to go.²³²

Hefner is clear that technological development, including the ethical challenges that often accompany it, is one of the means by which we exercise our agency as created co-creators.²³³ This co-creative agency is not afforded to us as a means to advance our own self-interested ends, however. Rather, we are to exercise this

224. Hefner, *THF*, 67.

225. *ibid.*, 109.

226. Philip Hefner, *Technology and Human Becoming* (Fortress Press, 2003), 87.

227. *ibid.*, 86. Hefner cites the well-known line from Augustine’s *Confessions*, “You have created us for union with yourself, and our hearts are restless until we find our rest in you” in support of his argument that restlessness is the medium by which we attain union with God (*ibid.*, 86; c.f. Augustine, *Confessions*, i.i.1).

228. Philip Hefner, “Nature, Mystery and God,” in *Our Bodies Are Selves*, ed. Philip Hefner, Ann Milliken Pederson, and Susan Barreto (Cascade Books, 2015), 153.

229. *ibid.*, 153; c.f. Pierre Teilhard de Chardin, “Mass on the World,” in *Hymn of the Universe*, trans. Gerald Vann (Harper & Row, 1965).

230. Hefner, *Technology and Human Becoming*, 34.

231. *ibid.*, 35.

232. *ibid.*, 35.

233. Hefner, *THF*, 121.

freedom (or “stretching activity”) in order to realise God’s divine purposes for all creation.²³⁴ And for Hefner this appears to be a natural human instinct – “We are restless if we cannot change the world around us and within us in ways that we think are better.”²³⁵

Incidentally, this understanding of humans as co-creators is at the heart of many accounts that would associate human uniqueness with technological development. Ivan Colagè, for example, locates human uniqueness in our capacity for “shaping and transcending ourselves.”²³⁶ Defining human uniqueness in terms of a God-given mandate to co-create not only allows for the application of technology for the purpose of human enhancement, as alluded to above it may even be used in support of such endeavours.

Hefner takes a functional approach to the *imago Dei*, arguing that we represent God’s freedom, love and intentionality when we act as created co-creators.²³⁷ Others have explicitly connected the use of technology with the doctrine of the *imago Dei*.²³⁸ Indeed, a functional approach to the *imago Dei* has proven useful for explaining the human proclivity for technological activity and development.²³⁹ Hefner takes this a step further, however, suggesting that technology itself, as a new phase of evolution, can serve as a vessel for the image of God.²⁴⁰

Paul Tillich speaks of the three major functions of human life: self-integration (the incorporation of new experiences into the self), self-transcendence (the stretch toward the infinite), and self-creation (the use of language and technology in

234. *ibid.*, 48.

235. Hefner, “The Created Co-Creator Meets Cyborg”.

236. Ivan Colagè, “The Human Being Shaping and Transcending Itself: Written Language, Brain and Culture,” *Zygon* 50, no. 4 (2015), 1004.

237. Philip Hefner, “Biocultural Evolution: A Clue to the Meaning of Nature,” in *Evolutionary and Molecular Biology: Scientific Perspectives on Divine Action*, ed. Robert J. Russell, William R. Stoeger, and Francisco J. Ayala (Vatican Observatory & CTNS, 1998), 347.

238. See for example Stephen V. Monsma, *Responsible Technology: A Christian Perspective* (Eerdmans Publishing Co., 1986), 19.

239. Stephen Garner, “Transhumanism and the *imago Dei*: Narratives of Apprehension and Hope” (PhD diss., University of Auckland, 2006), 212. Of course, a functional understanding of the *imago Dei* is only one approach (and is possibly being overtaken by a relational understanding of the concept).

240. Hefner, *THF*, 77.

the creation of culture).²⁴¹ He also declares the technological city to be God's creation, through the intermediary of human creativity.²⁴² Willem Drees probes the relationship between technology and human values, arguing that technology and culture are intertwined.²⁴³ Technology is also spoken of theologically in the context of both human freedom and human responsibility. Stephen Monsma defines technology as:

a distinct human cultural activity in which human beings exercise freedom and responsibility to God by forming and transforming the natural creation, with the aid of tools and procedures, for practical ends and purposes.²⁴⁴

Assigning technological ingenuity to the realm of co-creation, or the status of humans as the *imago Dei*, does not mean that it is always employed for positive ends. Jason Roberts captures this well: "As products of *Homo sapiens*' ethically ambivalent biocultural nature, whatever 'cures' we create are true *pharmakoi* – potentially both poison and remedy."²⁴⁵ Though Hefner accepts the risks associated with the human mandate for co-creation, he believes humans are required to act regardless. He describes the technological crisis as a "challenge to our self-awareness and our efforts to discern human purpose in the most adequate way".²⁴⁶ Even so, science and technology constitute the medium through which we will express the future of life on earth."²⁴⁷ Technology is not merely external to us, it shapes our self-image in complex ways. Furthermore, the very existence and possibilities of technology should motivate us to "face up to the necessity of decisions and their complexity" with respect to the planet's future.²⁴⁸ "Technology speaks powerfully of a sense that leaving nature in its prehuman state is somehow a betrayal of

241. Paul Tillich, *Systematic Theology*, vol. 3 (James Nisbet & Co., 1964), 32–34, 61–66.

242. Paul Tillich, "The Technological City as Symbol," in *The Spiritual Situation in Our Technological Society*, ed. J. Mark Thomas and D. Ric Thomas (Mercer University Press, 1988).

243. Willem Drees, "Introduction: Technological and Moral Creatures or Creatures?," in *Creative Creatures: Values and Ethical Issues in Theology, Science and Technology*, ed. Ulf Görman, Willem B. Drees, and Hubert Meisinger (T & T Clark International, 2005), 3.

244. Monsma, *Responsible Technology*, 19.

245. Jason Roberts, "'Fill and Subdue?'" *Imaging God in New Social and Ecological Contexts*, *Zygon* 50, no. 1 (2015), 60.

246. Hefner, *THF*, 49.

247. *ibid.*, 105.

248. *ibid.*, 105.

human genius.”²⁴⁹ The tension between the ambivalence of technology and the moral imperative to find technological solutions will be picked up again in later sections, as adoptions and extensions of Hefner’s model are explored.

3.3.2 The Theological Application of the Created Co-Creator to Biotechnological Issues

The analysis thus far suggests that Hefner’s created co-creator model may serve as a starting point for a theological response to human technological enhancement. The utility of Hefner’s created co-creator metaphor for engaging questions related to human enhancement is further supported by its incorporation into the work of several contemporary theologians addressing similar issues. This section considers the theological positions of Cole-Turner and Peters on human creativity, examining how they build on and modify Hefner’s concept. The central question addressed is whether co-creation, taking into account various interpretations of the concept, is a useful and sufficient metaphor for understanding human creativity, and might constitute a sufficient and orthodox Christian response to the challenges of transhumanism. While focusing on Cole-Turner’s and Peters’ interpretations of Hefner’s work, this section will also consider more generally the usefulness and limits of the created co-creator designation for understanding the human role in ongoing creation.

Ronald Cole-Turner

Cole-Turner was discussed briefly in the previous chapter in the context of more positive Christian responses to human enhancement. As a Christian ethicist, Cole-Turner argues from a position that locates the notion of human transformation within Christian thought. He draws upon the popular maxim, dating back to Irenaeus but reiterated by many others, that “God becomes like us so we might be made like God.”²⁵⁰ Cole-Turner compels us to see that technology use is bound up with

249. *ibid.*, 70.

250. Ronald Cole-Turner, “Introduction: The Transhumanist Challenge,” in *Transhumanism and Transcendence: Christian Hope in an Age of Technological Enhancement*, ed. Ronald Cole-Turner (Georgetown University Press, 2011), 5. C.f. Irenaeus, “Against Heresies,” in *Ante-Nicene Fathers*, ed. Alexander Roberts and James Donaldson, vol. 1 (Hendrickson Publishers, 2004), v. Cole-Turner’s appropriation of Irenaeus’ phrase warrants fuller explanation elsewhere. He does not

our theological understanding of humanity.²⁵¹ We must ground our deliberations over the value and implementation of human enhancement technologies within a greater theological vision.²⁵² For Cole-Turner, that vision is of a humanity created in God's image, being redeemed and transformed in Christ by grace.²⁵³

Concerning the ethics of various biotechnologies, Cole-Turner challenges the use of the phrase "playing God" and its implication that "creation is completed, static and fixed in place by God."²⁵⁴ He draws upon scientific accounts of progress in nature, an idea that he claims grew out of the Christian view of history.²⁵⁵ He attributes to nature, both human and non-human, a moral ambiguity that is currently unresolved.²⁵⁶ However, human nature is dynamic, driven by the purpose of glorifying God.²⁵⁷

Within his understanding of creation as continually evolving, Cole-Turner subscribes to the notion that humans are "co-creators" with God. Acknowledging the problems inherent in the term "co-creation" by itself,²⁵⁸ Cole-Turner follows Hefner's lead in adopting the modified "created co-creator" construction.²⁵⁹ While acknowledging our creatureliness, Cole-Turner describes a vision that "through biotechnology we can accompany God's own continuing creative work, which because of technology can operate now at a wholly new level."²⁶⁰

Cole-Turner's understanding of what it means for humans to be co-creators is further revealed in the reservations he expresses over the phrase "playing God." He

appear to do justice to Irenaeus' original meaning, which likely concerns adoption more than human creativity. For a helpful account of $\theta\acute{\epsilon}\omega\sigma\iota\varsigma$ in Irenaeus see B. C. Blackwell, *Christosis: Pauline Soteriology in Light of Deification in Irenaeus and Cyril of Alexandria*, trans. J. E. Steely (Mohr Siebeck, 2011). Even Cole-Turner's translation is problematic; he does not cite Irenaeus but rather later iterations of the idea.

251. Cole-Turner, "Religion, Genetics and the Future", 6.

252. Cole-Turner, "Introduction", 6.

253. *ibid.*, 6.

254. Cole-Turner, "Biotechnology", 942.

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

256. *ibid.*, 59.

257. *ibid.*, 62.

258. The major problem, of course, being that it suggests God and humanity are on an equal footing as partners in creation (Cole-Turner, "Biotechnology", 942).

259. *ibid.*, 943.

260. *ibid.*, 942.

challenges the implication that modifying nature with technology is illegitimate, linking this to a fallacious understanding of nature as static.²⁶¹ He also rejects the view that some aspects of creation (he gives the example of the human embryo) are granted a special status and treated as “wholly off limits to technology.”²⁶² This is consistent with Cole-Turner’s early argument that the gene is not the “exclusive realm of divine grace and creativity” and that treating DNA as sacred is therefore arbitrary.²⁶³ He points out that genomic research has not lived up to initial expectations – to date it has proven difficult or impossible in the overwhelming majority of cases to predict functionality from genomic sequence.²⁶⁴

Precisely what *is* fundamental to being human in Cole-Turner’s view is less evident. In tension with the understanding of humans as co-creators, he affirms that “human beings are creatures whose meaning and destiny are only understood in relation to the Creator.”²⁶⁵ He also suggests, however, that a greater knowledge of human biology and genetic engineering might actually provide insight into the constraints (e.g. physical and chemical) under which God creates.²⁶⁶ Human nature, therefore, reveals something of its creator.

Cole-Turner is clear when it comes to the goal of human enhancement technology. For Christians, the only objective can be “to transform the person in the direction of the new creation in Jesus Christ.”²⁶⁷ While Cole-Turner is open to the use of human enhancement technologies as a part of this transformation, his enthusiasm is not unqualified. He warns that “a new self through prayer is not the same as a

261. *ibid.*, 942.

262. *ibid.*, 942.

263. Cole-Turner, *The New Genesis*, 45.

264. Ronald Cole-Turner, “Synthetic Biology: Theological Questions about Biological Engineering,” in *Without Nature? A New Condition for Theology*, ed. David Albertson and Cabell King (Fordham University Press, 2010), 144. Possibly the early optimism anticipating the completion of the Human Genome Project has contributed to the tendency of bioethicists to consider the gene to be of special significance. Cole-Turner’s rejection of such arguments is supported also by some who profess no religious affiliation. Alex Maun, for example, protests against “the expectation that the human genome will be the last word on human nature” (Alex Maun, “Is the Genome the Secular Equivalent of the Soul?,” *Science* 291, no. 5505 (2001), 832).

265. Cole-Turner, “Religion, Genetics and the Future”, 213.

266. Cole-Turner, “Synthetic Biology”, 150.

267. Ronald Cole-Turner, ed., *Transhumanism and Transcendence: Christian Hope in an Age of Technological Enhancement* (Georgetown University Press, 2011), 10.

new self through technology.”²⁶⁸ With this caveat, he does concede that religious means of self-modification and technological means can complement each other.²⁶⁹ However, technology must not be established as a rival god, but rather serves as a tool to further the purposes of the true God and to ultimately glorify him.²⁷⁰ Furthermore, Cole-Turner is skeptical when it comes to human moral reasoning, acknowledging the tension between good intentions and flawed human nature.²⁷¹ This understanding leads him to limit the application of germline modification on the basis of motive: only those uses which spring from compassion, and do not promote injustice, are acceptable.²⁷²

Cole-Turner’s final position toward human technological enhancement can be summarised in the test he prescribes for such technologies:

The central theological question raised by technologies that modify humans is whether they serve the purposes of God in creating and renewing or redeeming the creation.²⁷³

This statement exemplifies the nebulous nature of Cole-Turner’s work, and perhaps the difficulty of addressing human enhancement from a theological perspective more generally. He does not elaborate on what he considers the “purposes of God” to be. There is also an alarming degree of dissonance between the probable future Cole-Turner describes as a result of using technologies for human enhancement, and a Christian vision of redemption. “Technologized people will be feared as dangerous, envied as superhumans, shunned as anomalies, and followed as great leaders. . . .”²⁷⁴ While he paints this picture as part of a call for theologians to engage with the issues that technological progress is rendering inevitable, it is still difficult to see how this might be compatible in any way with a Christian eschatology, despite Cole-Turner’s argument that this is possible.

²⁶⁸. Cole-Turner, “Biotechnology”, 941.

²⁶⁹. *ibid.*, 941.

²⁷⁰. *ibid.*; Cole-Turner, *The New Genesis*, 51.

²⁷¹. Ronald Cole-Turner, “Human Limits: Theological Perspectives on Germ-Line Modification,” in *Designing Our Descendants: The Promises and Perils of Genetic Modifications*, ed. Audrey Chapman and Mark Frankel (John Hopkins University Press, 2003), 192–193.

²⁷². *ibid.*, 193.

²⁷³. Cole-Turner, “Religion, Genetics and the Future”, 213.

²⁷⁴. *ibid.*, 221. We do not have to look far to find parallel visions in science fiction.

Perhaps the most interesting current in Cole-Turner’s thought is his identification of transhumanist visions of the future as not completely dissimilar to those of many Christians. It is this shared impulse for transcendence, this common imagination of a transformed humanity, that holds the promise of a way forward in the dialogue between science and theology over genetic enhancement technologies and the future. While theological perspectives on human dignity and worth shape responses to particular technologies, the existence and prospect of such technologies must also challenge and inform a theological understanding of what it means to be human. Cole-Turner is interested in both sides of this debate and issues a particularly pertinent challenge for theologians considering the place of technology in our transformation and redemption – “Is this simply a case of Christians needing to update their repertoire of the modalities of grace?”²⁷⁵

Cole-Turner’s affirmative answer to this question springs from his understanding of human creativity, developed in part through an interaction with Hefner’s work. While Cole-Turner does draw significantly on Hefner, his representation of co-creation looks very different. Hefner begins with a scientific methodology and a consideration of evolutionary history, concluding that *Homo sapiens* has emerged from the evolutionary process as a biocultural organism with the capacity to shape its own future evolution. Cole-Turner writes as a Christian theologian first and grounds his understanding of co-creation firmly within the theological landscape of creation and redemption. For Cole-Turner, humans partner with God in his creative and redemptive work at the invitation of God,²⁷⁶ whereas Hefner sees this activity as an evolved freedom, which in turn is an instrumentality of God.²⁷⁷

Ted Peters

Peters differs from Hefner in identifying as a systematic theologian. Whereas Hefner attempts to articulate theology in scientific terms, Peters sees his own task as a

275. Cole-Turner, “Introduction”, 9.

276. Cole-Turner, *The New Genesis*, 11.

277. Hefner, *THF*, 32.

“response theology” – “a form of intellectual discourse that responds theologically to issues prompted by public debate over scientific matters”.²⁷⁸

Similarly, Peters argues that humans cannot help but use technology, it is fundamental to our nature.

Human creativity is ambiguous. We are condemned to be creative. We cannot avoid it. The human being is a tool maker and a tool user. We are *homo faber*. We cannot be human without being technological. . . .²⁷⁹

The use of technology in service of “neighbour love” or beneficence, according to Peters, means “we are playing human in a free and responsible way.”²⁸⁰ By employing our creativity and ingenuity to devise new ways of improving ourselves, provided it is in service of the flourishing of all creation, we are not “playing God” but rather acting in a way that is fundamentally human. “To seek a better future is to ‘play human’ as God intends us to.”²⁸¹

Peters is pragmatic when it comes to the likelihood of human enhancement technologies being employed in the future, arguing that:

The task before us is to be good stewards of the advance of genetic science and technology so that it contributes to human welfare without creating new injustices.²⁸²

Our “ethical mandate” concerns the purpose to which we direct our creativity and the seriousness with which we approach our creative responsibilities.²⁸³

To influence our own evolutionary development is to invoke human creativity, to exercise the freedom that makes self-determination possible – in this case, the human race as a totality is the self doing the determining.²⁸⁴

Peters differs from Hefner in that he is not reluctant concerning the theological statements he makes. Whereas Hefner attempts to convey his message in terms

278. Peters, *Playing God? Genetic Determinism and Human Freedom*, xv. Peters does describe his approach as the borrowing of “methods of inquiry from the natural sciences” for use in “theological research programs” but arguably his work is still more explicitly theological than Hefner aims to be in *THF* (*ibid.*, xvi).

279. Ted Peters, *Science, Theology and Ethics* (Ashgate Publishing, 2003), 222.

280. Peters, *Playing God? Genetic Determinism and Human Freedom*, 27.

281. *ibid.*, 146.

282. *ibid.*, 2.

283. *ibid.*, 16.

284. *ibid.*, 20.

acceptable to a naturalist position, Peters argues that a theological perspective is essential to understand our place in nature.

...nature, theologically understood as the product of God’s creative work, actually inclines us toward the good. Nature perceived scientifically hides this truth To see the lure of nature toward what is good requires discernment; it requires a vision of divinely promised redemption.²⁸⁵

For Peters, the resurrection of Christ is central to the debate on human enhancement.²⁸⁶ Though he questions projects which attempt to provide a vision of human nature without recourse to theological statements, he does acknowledge the value in demonstrating the compatibility of scientific and theological anthropologies.²⁸⁷

Peters summarises the difficulty of distinguishing between human and divine creativity well.

Theologically, just how sound is it to separate so sharply between what God creates and what human invention creates? If we make such a distinction, then how do we identify what God creates? Should we presume that something found in nature that has not yet been touched by human technology constitutes a divine creation? Does it mean that as soon as human creativity alters its natural state that it leaves the realm of divine creation and enters the realm of human creation? Does it mean that God creates only part of reality and that human technology creates a different part?²⁸⁸

Peter sees in Hefner’s created co-creator proposal a two-dimensional understanding of creation that is able to address this problem of situating human creativity. Despite the analogous relationship between human and divine creativity, Peters resists attempts to equate one with the other. Peterson, describing Peters’ understanding of the created co-creator metaphor, suggests that it “stands both as an encouragement to create and as a warning against utopian hubris”.²⁸⁹ The doctrines of *creatio ex nihilo* and *creatio continua* are key – everything that exists is a result of God’s creative act.²⁹⁰ Peters contends:

285. *ibid.*, 21.

286. *ibid.*, 63.

287. *ibid.*, 51.

288. *ibid.*, 124.

289. Peterson, “The Created Co-Creator”, 233.

290. Peters, *Playing God? Genetic Determinism and Human Freedom*, 125.

One might even include evolutionary history in the story of God's ongoing creative work. One might further include the evolutionary development of the human genome with its resulting intelligence and creativity – as an additional chapter in the story of nature. At this point divine creativity and human creativity enjoy some overlap. They are not sharply separated.

For Peters, God's creative activity is best understood as the giving of a future to the world.²⁹¹ An ethics of co-creation therefore demands of us that we envision a better future.²⁹² Peters concludes from this that we should at least “keep the door open” for human technological enhancement.²⁹³ With such a future-oriented theology of creation we are better equipped to consider the challenges of enhancing human beings through technology.²⁹⁴ Finally, Peters reminds us that human power and divine power are not in competition – ascribing creative agency to humans does not diminish divine creativity in any way.²⁹⁵

Usefulness of the Created Co-Creator Designation

Hefner's account is an admirable effort to synthesise evolutionary insights with a theological perspective on human creativity. But how helpful is the co-creator metaphor ultimately for explaining our role in creation? The scope of responses to Hefner's work, and differing interpretations of his thought, suggest that the co-creator designation, even when qualified with the “created” modifier, is of limited utility. The versatility in its application points to an inherent ambiguity. It can be employed on the one hand to elevate humans to almost divine status in their creative activity,²⁹⁶ or understood as a close synonym for human stewardship of God's creation.²⁹⁷

Anna Case-Winters raises a similar question, suggesting that Hefner's created co-creator does not differ fundamentally from the notion of stewardship. This is by no means the prevailing view, however, with Paul Jersild, for example, arguing that stewardship and co-creation are very different concepts.²⁹⁸ Peterson argues

291. Peters, *Playing God? Genetic Determinism and Human Freedom*, 146.

292. *ibid.*, 146.

293. *ibid.*, 146.

294. *ibid.*, 157.

295. *ibid.*, 208.

296. Garner, “Transhumanism and the imago Dei”, 200.

297. Anna Case-Winters, “Rethinking the Image of God,” *Zygon* 39, no. 4 (2004), 821.

298. Paul Jersild, *Spirit Ethics: Scripture and the Moral Life* (Fortress Press, 2000), 167–70.

that “the deceitfully diminutive *co-* is in some ways the most radical and least appreciated part of Hefner’s project”, interpreting the prefix to mean that “we are as much in control or responsible for creation as God is”.²⁹⁹ This lack of consensus only serves to highlight the term’s ambiguity. Various interlocutors of Hefner’s have offered their own terminology as a substitute for the created co-creator. Peterson, for example, suggests “creative creatures” as a more suitable alternative,³⁰⁰ while Burdett corrects to “created intra-creator” (interpreting Hefner’s model within a strong trinitarian and Christological framework).³⁰¹

Hefner does acknowledge the vulnerability of the term “co-creator” to criticism, and well as the proposals for various alternative terms. He rejects alternatives and affirms “co-creator”, however, as he believes that only the latter does justice to the dual nature of humans and the polarity that comes of being created yet also co-creator.³⁰² He suggests that, though a dangerous concept at risk of being misconstrued, the risk is unavoidable if we are to fulfil the anthropological task in light of current global challenges.³⁰³

Acknowledging the potential for misinterpretation, the current project will proceed with the term “co-creation” as a theological term that ascribes a role to humans in ongoing creation, albeit one that is both distinct from and subordinate to God’s work of creation. It may be contrasted with a notion of humans as merely vehicles or passive recipients of God’s creation. An understanding of humans as co-creators asserts that “rearranging matter, supercreating, and bringing new possibilities into existence, are basic to human nature”.³⁰⁴

3.3.3 The Limits of Co-Creation

Aside from its susceptibility to misinterpretation, it is also unclear from Hefner’s exposition of the created co-creator just how we are to determine whether our

299. Peterson, “The Created Co-Creator”, 829.

300. James Peterson, *Genetic Turning Points: The Ethics of Human Genetic Intervention* (Eerdmans Publishing Co., 2001), 55.

301. Burdett, *Eschatology and the Technological Future*, 244n.

302. Hefner, *THF*, 37, 39.

303. *ibid.*, 237.

304. Hefner, *Technology and Human Becoming*, 81.

co-creative activity is aligned with divine purposes. This is not to say that the goal must be to articulate a foolproof set of rules for arbitrating whether a particular action is appropriate co-creative activity or not. This would reduce the question to a simple deontological ethic, which has proven generally insufficient and unsatisfactory in addressing moral quandaries. Yet if we *are* created co-creators, then we must be equipped in some way to judge our creative endeavours. A stronger sense of limits and the discernment process would be helpful.

Others have critiqued Hefner's model for its weaknesses when it comes to discernment. Peterson questions how the freedom of the created co-creator is to be used, and calls for the development of an appropriate ethic to support the anthropological claims made by Hefner.³⁰⁵ The "wholesome future" Hefner refers to, the birthing of which is the goal of human co-creative activity, needs to be filled out, however Hefner has little to say on this.³⁰⁶

Proponents of co-creation are not blind to the difficulties surrounding the discernment of appropriate creative action. Peacocke sets out the problem eloquently:

The exploration which is science and its progeny, technology, might then come to be seen as an aspect of the fulfilment of man's personal and social development in co-operation with the God who all the time is creating the new. Man would then, through his science and technology, be exploring with God the creative possibilities within the universe God has brought into being. This is to see man as co-explorer with God. But these themes, of co-creation and co-exploration, imply intelligent participation by man in God's work of creation. And for that God's meaning has to be discerned.³⁰⁷

Hefner is certainly aware of the ambivalence of the created co-creator and its ability to act according to the divine will. Tying this quality ultimately to human freedom, he writes:

There is unmistakeable grace mediated through the co-creator's technological accomplishments. . . . Evolution itself will be the instrument of God's judgment and grace with respect to this work of the co-creator. If humans survive, they alone will bear the responsibility for the future and they alone will be able to seize the opportunities to actualize the possibilities for grace that are contained within it."³⁰⁸

305. Peterson, "The Created Co-Creator", 839.

306. *ibid.*, 837.

307. Peacocke, *Creation and the World of Science*, 306.

308. Hefner, *THF*, 250.

More recently he speaks anew of the “ambivalent double vision that sees both danger and possibility”, acknowledging this as a challenge for the way in which we create.³⁰⁹ Hefner also suggests there are limits to co-creation in his rejection of an infinite malleability to human nature.³¹⁰ Rather, “there are structures to which we are beholden for our very nature... which can be repudiated or ignored only at our peril.”³¹¹ As humans, we are to actively seek the bounds that define us.³¹² Yet we do not have autonomous power when it comes to co-creation, and the power that we do have stems from God’s prevenient action.

[God] unleashed the process of evolution and it has come to this – a species with the capacity for self-awareness and ecosystem-defining power and responsibility. This we share with God himself, since this defining power and responsibility are his. By his grace, he has determined, or at least permitted, that his creator-power of defining, naming, and using shall be advanced and carried out through the agency of *Homo sapiens*.³¹³

Peters also acknowledges the dangers inherent in human creativity, the tension that exists between the ability to enhance human freedom and improve the world on one hand, and inflict suffering through either ignorance or malicious intent on the other.³¹⁴ A major critique he offers of transhumanism is its failure “to operate with an anthropology that is realistic regarding the human proclivity to turn good into evil”.³¹⁵ Cole-Turner is even more cautious than Hefner in this respect. While he does ultimately support some form of co-creation as an explanation for human creative participation, he expresses reservations with the metaphor. These chiefly concern the issue of discerning the divine will for human co-creative activity.³¹⁶ Cole-Turner is less optimistic than Hefner in his assessment of the human capacity

309. Hefner, “The Created Co-Creator Meets Cyborg”, 5.

310. Hefner, “The Foundations of Belonging”, 162.

311. *ibid.*, 163.

312. *ibid.*, 171.

313. *ibid.*, 176.

314. Peters, *Playing God? Genetic Determinism and Human Freedom*, 59.

315. Ted Peters, “CRISPR, the Precautionary Principle, and Bioethics,” *Theology and Science* 13, no. 3 (2015), 131.

316. Ronald Cole-Turner, “Is Genetic Engineering Co-Creation?,” *Theology Today* 44, no. 3 (1987), 345; Cole-Turner, *The New Genesis*, 101; Cole-Turner, “Human Limits”, 192–193. Hefner’s qualifier of “created” goes a long way to easing Cole-Turner’s concerns with respect to co-creation, however, and allows him to finally adopt the metaphor for his own use (Cole-Turner, “Biotechnology”, 942–943).

for discernment. This may be because Cole-Turner takes the effects of sin far more seriously than Hefner, whose account of sin reduces it largely to the tension between the biological drives remnant of our evolutionary past and the impulses that spring from our sociocultural nature.³¹⁷ As long as Cole-Turner explicitly, albeit tentatively, affirms a co-creative role for humans, however, the tension between human creating and ignorance of divine intent remains unresolved in his work and, like Hefner, his account of human creativity would benefit from a more robustly articulated sense of boundaries. As mentioned above, Cole-Turner does hint that gains in scientific knowledge may illuminate constraints to creativity.³¹⁸ It is unclear whether he extends this to human creativity as well, or would restrict it to divine creativity. Even assuming the former, however, we are left with only an impression that limits to human co-creation exist, but no constructive means for determining their nature. We are to “place our work and our powers in the service of a creator who is still creating a future not yet determined”;³¹⁹ how we might go about this task is less plain. He offers the motives of those creating as a criterion for judgement,³²⁰ however it does not necessarily follow that good intentions produce outcomes aligned with the divine purpose for creation.

Cole-Turner takes pains to emphasise that human works are subsumed under the divine: “Does technology play any role in *what a gracious God is doing* to carry forward to completion this great project known as creation?”³²¹ Elsewhere, he implores us to consider that “our technology can and should be seen as instruments in the creator’s hands, by which God will continue to sculpt Adam’s clay. . . .”³²² He avoids ascribing a concrete sense of agency to humans despite his final affirmation of their status as created co-creators, prompting the question of whether the metaphor adequately conveys his stance on human creativity. While Cole-Turner clearly

317. Hefner, *THF*, 131–132.

318. Cole-Turner, “Synthetic Biology”, 150.

319. Cole-Turner, “Is Genetic Engineering Co-Creation?”, 349.

320. Cole-Turner, “Human Limits”, 193.

321. Cole-Turner, “Going beyond the Human”, 155, emphasis added.

322. Ronald Cole-Turner, “Toward a Theology for the Age of Biotechnology,” in *Beyond Cloning: Religion and the Remaking of Humanity*, ed. Ronald Cole-Turner (Trinity Press International, 2001), 150. Despite his lack of capitalisation for “creator” in this passage, it is clear from the context that he is referring to God, and not to humans.

affirms technology as a modality of divine grace, he is less certain regarding the extent to which the responsibility for human technological enhancement is delegated to humans. His equivocation on this matter further reinforces the ambiguous nature of the term co-creation; at the very least it seems to set up a false dichotomy between human agency and divine will in creation. He often falls back on the more widely used language of “partnership” when it comes to human creativity, linking it explicitly with our use of technology.³²³

It is clear from these accounts that the created co-creator should not be understood to mean that God has handed over God’s creative agency to humans, or that humans are in any way equal to God in their creativity. The existence of limits is affirmed by all of the theologians examined here. Having established that such limits exist however, the problem of discernment remains. How are we to discover such limits as we go about our creative work, particularly as we are faced with various global crises that prompt us to act?

In one sense, Cole-Turner comes closer to Hefner in prescribing a practical limit to human technological intervention. He argues that we can define a genetic defect as “that which causes a condition comparable to those which evoked the compassion of Jesus of Nazareth and which is therefore disclosed as contrary to the purposes of God.”³²⁴ If we can imagine that Jesus would have healed, then we should do the same if we are able. Certainly this is a more tangible approach toward defining limits than Hefner provides, and an idea worth exploring elsewhere, however it still places the responsibility of discernment with the fallible human intellect. Additionally, this principle may validate many therapeutic applications of genetic manipulation, but is of little utility when it comes to enhancement. Of more use, perhaps, is Cole-Turner’s argument that we must accord noetic priority to theological insights concerning redemption over scientific observations of nature,³²⁵ however this point raises a different set of hermeneutical difficulties for discerning divine purpose.

323. Cole-Turner, *The New Genesis*, 100.

324. *ibid.*, 91.

325. *ibid.*, 102.

Roberts aims for more a concrete defining of the boundaries to co-creation, articulating four guiding principles for future created co-creation. These principles are (1) the distinction between our biocultural and eschatological futures, (2) an understanding of humans and the good works they do as both wholly natural and mediators of grace, (3) a resistance to the transhumanist view that death ought to be defeated, and (4) an acknowledgement that human freedom is finite and fallible.³²⁶ With the exception of the third principle perhaps, none of Robert's articulated guidelines offer pragmatic advice – in fact, the final guideline is really just a reaffirmation of human limitation. Instead, Roberts offers overarching statements such as “while humanity's biocultural and eschatological futures ought not to be conflated, the effort we exert toward our biocultural future *may* matter in ‘the end.’”³²⁷ Garner takes a slightly different approach, suggesting that the created co-creator might be employed effectively to ethical questions in conjunction with the bioethical principles of autonomy, nonmaleficence, beneficence and justice.³²⁸ Like Roberts' proposal, these principles operate at a broader level. How might we develop these general principles to aid us as we consider various technological options and deliberate over the best course of action?

3.3.4 The Role of the Imagination for the Created Co-Creator

Although Hefner does not consider the role of the imagination for the work of the created co-creator, he does recognise its importance in elucidating the concept. *The Human Factor* is filled with references to poetry that illuminate his conclusions concerning human nature. In *Technology and Human Becoming* he draws on both poetry and visual artwork to illustrate human attitudes toward technology.³²⁹ He at least perceives the explanatory power of fiction and art, though he does not engage

326. Roberts, ““Fill and Subdue?””, 57–59.

327. *ibid.*, 57, emphasis added.

328. Garner, “Christian Theology and Transhumanism”. Garner derives these principles from the programmatic work of bioethics, Tom Beauchamp and James Childress, *Principles of Biomedical Ethics* (Oxford University Press USA, 2001).

329. Hefner, *Technology and Human Becoming*, 1–2, 89.

the imagination beyond the purpose of illustration. More recently, he calls for a greater imaginative component in our response to contemporary challenges.

We are the storytellers of nature, the ones whose ecological niche includes articulating nature’s project. In this, we join the work of the poets. It may well be that not only has evolution entered the stage of morality and spirituality, but also the phase of poetry, in which imaginative frameworks of meaning that can interpret nature are essential for nature’s continued life.³³⁰

This appears to be a reversal of Hefner’s earlier view, expressed in *The Human Factor*, that the role of artists in creating new mythic proposals is secondary to that of preachers, politicians, and business/technology entrepreneurs.³³¹ Perhaps Hefner’s created co-creator would look different if he were developing it today. In his later reflections on technology, Hefner suggested that “technology emerges from our freedom to imagine what does not exist and to believe in what is not actual”.³³² He celebrates a number of scientific achievements, from the codebreaking work of Alan Turing and his contemporaries to the discovery of DNA and the completion of the Human Genome Project, emphasising the narratives that underpinned these endeavours.³³³ Hefner points out in his most recent discussion of technology that imagining alternative worlds, and acting on those imaginings, comes naturally to humans.³³⁴ It is fair to say that Hefner’s appreciation of imagination and its importance has grown over the course of his career, as he later connects the imagination more explicitly with the work of the created co-creator.³³⁵ In our role as co-creators we create both new worlds with our technology, and the meaning and purpose of those new worlds.³³⁶ Yet Hefner identifies a reluctance on the part of many to acknowledge the centrality of imagination and story for human existence.

Most of the people who are known today for their mastery of the dense facts of the world – scientist, engineers, policymakers, and the like – do not cotton

330. Philip Hefner, “A Fuller Concept of Evolution - Big Bang to Spirit,” *Zygon* 47, no. 2 (2012), 307.

331. Hefner, *THF*, 214.

332. Hefner, *Technology and Human Becoming*, 60.

333. *ibid.*, 60–63.

334. Philip Hefner, “The Human Journey,” in *Our Bodies Are Selves*, ed. Philip Hefner, Ann Milliken Pederson, and Susan Barreto (Cascade Books, 2015), 134.

335. Hefner, *THF*, 78.

336. *ibid.*, 77–78.

to the idea that their work is dependent on imagination and story. Most religious believers share this skepticism about story. Most of the scientists and religious people I know share a dislike for the word *postmodern* precisely because they wish to fence off fact from story.³³⁷

Like Hefner, Cole-Turner gives an account of human creativity that emphasises rationality. They presume some kind of epistemic access to the principles that guide co-creation (even if they cannot articulate the nature of this access and express caution) but do not offer a plausible means for attaining such knowledge. Their concept of human creativity is more promising for theological engagement with the scientific challenges of our times than a fearful Christian response to technological advances, but still privileges the role of reason at the expense of the imagination. It is possible that this elevation of reason can be traced back to Hefner's choice of a Lakatosian model in the first place – Lakatos was above all else a rationalist.³³⁸ In Hefner's modification of Lakatos' work, and in Cole-Turner's adaptation of Hefner's model, the central place of reason has been preserved. This is not to say that the locatedness of humans and the associated epistemic limitations are not acknowledged – Hefner writes that “reason does not have the capability of climbing some hill to get an overview of all there is.”³³⁹ Yet reason is still the means by which we probe into the depths of nature in order to encounter truth, even if that truth is only partial.³⁴⁰

Despite not developing an imaginative component in his work, Cole-Turner does appear to recognise the importance of such resources. He draws an interesting parallel between the transition to an agricultural way of life depicted in Genesis and the current impending transition to a society that relies on genetic engineering technologies.³⁴¹ Both transitions, he argues, are theological as well as technological, with the prospect of genetic engineering reopening the question of the human place

337. Hefner, *Technology and Human Becoming*, 68. This is perhaps less true today than it was when Hefner wrote it in 2003, as the importance of the imagination continues to attract scholarly attention, however this certainly illuminates both Hefner's context and the need to enrich the imaginative content in his work.

338. Paul Feyerabend, Robert Cohen, and Marx Wartofsky, eds., *Essays in Memory of Imre Lakatos*, 458–491 (D. Reidel Publishing Company, 1976), preface.

339. Hefner, *THF*, 79–80.

340. *ibid.*, 81.

341. Cole-Turner, “Is Genetic Engineering Co-Creation?”, 343.

in nature by giving us the power to create.³⁴² Most interesting, however, is the response he suggests to these challenges:

What we need today is a sustained effort at theological and poetic imagination that will yield texts and liturgies for the new age. We need visions and images that will sustain and restrain us as we define ourselves in the future.³⁴³

Peters, too, acknowledges the importance of imagination for co-creation. He ties our ability to imagine alternate futures, our desire to create something new “according to a vision of a better reality” to the freedom we have in the future given to us by God.

The human imagination invents philosophy and projects universals that liberate us from bondage to the concrete situation to which our biological natures are subjected. We are free to build and play in imaginary structures above the actual structures to which we are by nature bound. We are free to create new worlds, to develop arts and technologies that so alter our environment, and even our biological make-up, that our world of meaning transcends the dictates of our prehuman natural history³⁴⁴

This leads us to one of the major questions posed in the present study – what if using and engaging the imagination was considered instrumental in theological construction, not just illustration? Incorporating the imagination in constructing narratives of the future, even a future which features technological enhancement, may go some way to reconciling the dissonance previously identified between the tentative endorsement of enhancement technologies by certain theologians and the bleak future envisioned as a likely outcome of such activity.

Chapter Conclusion

In a project concerned with a contemporary understanding of human enhancement and its theological implications, it may seem an odd decision to have given so much attention to Hefner, whose major work in the field is more than twenty years old and dealt with technological enhancement rather incidentally. Hefner’s understanding of the human as created co-creator is located within a long tradition

342. *ibid.*, 338–339.

343. (*ibid.*, 343).

344. Peters, *Playing God? Genetic Determinism and Human Freedom*, 204.

of co-creation theologies. Yet Hefner's particular model contributes enormously to contemporary accounts that more explicitly address questions of enhancement, hence the need to engage with it critically.

Hefner's dependence on a Lakatosian research programme methodology, while rendering his own explanation of co-creation unique, is potentially problematic in light of the various critiques of Lakatos that have yet to be successfully dismissed. While Nancey Murphy argued for the applicability of a Lakatosian framework to theology early in her career, she was unable to sufficiently address criticisms of the model and has since discarded it in favour of MacIntyre's view of rationality.

The results of Hefner's articulation of the created co-creator using the structure of a Lakatosian research programme are also questionable. Many of the auxiliary hypotheses he proposes are not as falsifiable as he would have us believe. On the whole, however, Hefner's model appears to be compatible with the findings of contemporary science, albeit not always presented in a strictly scientific format. If Hefner's model is instead viewed as one that encompasses more than just a scientific approach to anthropology, and Hefner's stated objective to frame it in purely scientific terms is forgiven, then we may have the beginnings of a response to the challenges proposed by transhumanism and related developments.

For Hefner's model also has many strengths. It offers a theological anthropology that at least takes scientific insights seriously in its construction, and is open to engagement with contemporary questions surrounding technology. The adaptation of the created co-creator metaphor by theologians currently writing in response to biotechnological and bioethical concerns is a testament to its usefulness as a starting point in this growing area of study. As theologians venture further into the territory of human enhancement, their reflections will be strengthened by the appreciation for the insights of evolutionary biology, genetics and cognitive sciences modelled by Hefner.³⁴⁵

345. Hefner's proposal was selected as the focus of the present work as his approach centres on the subject of human creativity and theological anthropology, whereas Peters' work is more oriented to eschatology and Cole-Turner's to specific ethical concerns.

Acknowledging the weaknesses in Hefner’s model, namely its overemphasis on rationality and neglect of the imagination, the following chapters will consider the role accorded to the imagination in various philosophical, theological, and scientific schools of thought, and the potential for enriching Hefner’s anthropology with more imaginative perspectives on human creativity.

Reason's last step is the recognition that there are an infinite number of things which are beyond it.

— Blaise Pascal

If we try to understand the imagination while taking for granted that fiction is its central or typical business, we go as badly wrong as we would if we tried to understand arms and legs while taking for granted that dancing is their central or typical business.

— Timothy Williamson

4

Co-Creation and the Imagination

Contents

4.1	Imagination and Epistemology	130
4.1.1	Defining the Imagination	130
4.1.2	The Romantic Imagination	133
4.1.3	Imagination and Theology	137
4.1.4	Imaginative Science	141
4.1.5	Imagination, Reason and Belief	146
4.2	Why the Imaginative Deficit in Co-Creation Accounts? 149	
4.2.1	The Legacy of Rationalism	149
4.2.2	The Development of Science and Religion	153
4.2.3	Theological Heritage	157
4.2.4	Lakatos and Imagination	160

Chapter Overview

Given the imaginative dimensions of transhumanism, and the prominence of the imagination in the context of technological innovation, an exploration of imagination itself is warranted. What follows, therefore, is a brief survey of how the imagination is defined (especially in relation to creativity), and the role afforded to the imagination in epistemology, particularly in the disciplines of theology and science. Having identified an underdeveloped sense of the imagination in Hefner's theological

anthropology, several potential explanations for this lack are located in both his theological heritage and the science and religion field more generally.

4.1 Imagination and Epistemology

4.1.1 Defining the Imagination

Before we proceed further with an analysis of the role of the imagination in co-creation theology, it is worthwhile to briefly consider what is meant by the term itself. Richard Kearney highlights the necessity of defining the imagination in relation to its genealogy. “We need to recall what imagination was *then* in order to understand imagination *now*.”¹ With this caveat, the current scope will be limited to more recent understandings of the imagination but generally operates in alignment with James Engell’s exposition locating the origin of current understandings of the imagination in the eighteenth century.²

Creativity and imagination overlap somewhat semantically and conceptually. Rob Pope argues that the recent focus on the notion of creativity has encroached upon some of the territory that belongs properly to imagination.³ Hart describes the overlap between the two with a degree of hesitation, allowing that:

it is difficult to suppose other than that the two notions are naturally rather than unnaturally yoked, and if by no means all that is imaginative is “creative” in the sense we have now begun to associate with this term (nothing is more imaginative than a torture chamber), perhaps it is safe to suggest, nonetheless, that all that is creative is necessarily imaginative.⁴

1. Richard Kearney, *The Wake of Imagination: Toward a Postmodern Culture* (Routledge, 1994), 17.

2. See James Engell, *The Creative Imagination: Enlightenment to Romanticism* (Harvard University Press, 1981). There are divergent accounts of the imagination’s history. Douglas Hedley, for example, would instead locate the roots of contemporary understanding of the imagination in Platonism (Douglas Hedley, *Living Forms of the Imagination* (T & T Clark, 2008), 16). While there are certainly continuities, Engell’s account of the crucial impact of eighteenth century European philosophy for the way we understand the imagination today is more compelling. Murray, too, supports this interpretation with her contention that before the eighteenth century it would have been unthinkable to connect the imagination with truth in mainstream European thought (in introduction to Cocking, *Imagination*, xiii). Amos Funkenstein provides a helpful account of the imagination’s development prior to this period (Amos Funkenstein, *Theology and the Scientific Imagination: From the Middle Ages to the Seventeenth Century* (Princeton University Press, 1986)).

3. Pope, *Creativity*, 14.

4. Hart, *Making Good*, 94.

On the basis of such a distinction, a closer treatment of the imagination in the context of human creativity may direct us more helpfully in our moral assessment of what constitutes good co-creative activity, remembering that creativity itself is usually judged on the basis of value in some way.⁵ In the same way that creativity is fundamental to our “otherness” from God, Hart argues that imagination is an epistemic necessity of our creaturely reality if we are to know anything of God.⁶

In articulating the difficulty of defining the imagination Kearney compares it to Augustine’s observation of time – “we think we know what it is but when asked we realize we don’t.”⁷ Kendall Walton describes the term imagination as “serving as a placeholder for a notion yet to be fully clarified”.⁸ Derek Matravers, too, suggests that theorists are unclear in their meaning when they speak of the imagination.⁹ Amy Kind and Peter Kung attest that philosophers tend to talk past each other when developing accounts of the imagination, arriving at different conceptions.¹⁰ Kind argues further that conceptions of the imagination are heterogenous to the extent that “no single mental activity can do all the explanatory work that has been assigned to imagining”.¹¹

Penelope Murray proposes that the term imagination denotes at its most basic level “the image-making capacity of human beings”.¹² Mark Johnson suggests “an extended Kantian view of imagination as a capacity for ordering mental representations into unified, coherent, meaningful wholes that we can understand and reason about”.¹³ Trevor Hart offers the helpful proposal that the various meanings

5. See page 53.

6. Hart, *Making Good*, 13.

7. Richard Kearney, *Poetics of Imaginings: Modern to Postmodern* (Edinburgh University Press, 1998), 1.

8. Kendall Walton, *Mimesis as Make-Believe: On the Foundation of the Representational Arts* (Harvard University Press, 1990), 21.

9. Derek Matravers, “Why We Should Give Up on the Imagination,” *Midwest Studies in Philosophy* 34 (2010), 190.

10. Amy Kind and Peter Kung, *Knowledge Through Imagination* (Oxford University Press, 2016), 2.

11. Amy Kind, “The Heterogeneity of the Imagination,” *Erkenntnis* 78, no. 1 (2013), 141. Walton, too, finds the identification of a common thread amongst the various conceptions of the imagination to be elusive (Walton, *Mimesis as Make-Believe*, 19).

12. Murray, in introduction to Cocking, *Imagination*, xiii.

13. Mark Johnson, *The Body in the Mind: The Bodily Basis of Meaning, Imagination, and Reason* (University of Chicago Press, 1987), 194.

ascribed to the term “imagination” might be thought of more in the sense of a family resemblance. Imagination and its cognates comprise a cluster of attributes, rather than a single defining attribute.¹⁴ John Coulson argues that we should attend more to the way in which the term “imagination” is used, defining it thus as “a particular kind of cognitive perception”.¹⁵ Similarly, Hart allows the reality of what imagination does to “shape our definition for us”, rather than offering a neat description.¹⁶ Providing a common definition of imagination here is therefore elusive due to the very fact that its nature and contribution is disputed among scholars.

Indeed, the character of imagination itself renders it difficult to define. James K. A. Smith likens it to an intuition that “eludes propositional articulation”, and cites Charles Taylor’s assertion that the imagination “can never be adequately expressed in the form of explicit doctrines”.¹⁷ The imagination is an affective faculty that attempts to make meaning of the world.¹⁸ Smith does attempt to give a more concrete definition, however, describing the imagination as a “quasi-faculty whereby we construe the world on a precognitive level, on a register that is fundamentally *aesthetic* because it is so closely tied to the *body*”.¹⁹ Smith adopts a heuristic use for the imagination that names “a kind of faculty by which we navigate and make sense of our world, but in ways and on a register that flies below the radar of conscious reflection”,²⁰ a working definition that is useful for the present purpose.

Acknowledging the lack of consensus when it comes to definition, and the heterogeneity inherent in the concept of imagination, let us turn to the way it

14. Trevor Hart, “Transfiguring Reality: Imagination and the Re-Shaping of the Human,” *Theology in Scotland* 8, no. 1 (2001), 7.

15. John Coulson, *Religion and Imagination: In Aid of a Grammar of Assent* (Clarendon Press, 1981), 6.

16. Trevor Hart, “The Glory of Imagination and the Imagination of Glory,” in *Called to Hope: Perspectives on Life to Come*, ed. John Colwell (Paternoster Press, 2000), 226.

17. James K. A. Smith, *Desiring the Kingdom: Worship, Worldview, and Cultural Formation* (Baker Academic, 2009), 66; c.f. Charles Taylor, *Modern Social Imaginaries* (Duke University Press, 2004), 25.

18. Smith, *Desiring the Kingdom*, 66.

19. James K. A. Smith, *Imagining the Kingdom: How Worship Works* (Baker Academic, 2013), 17, emphasis original. The linking here of the imagination to embodiment is especially important for the human enhancement debate and its implications for human bodies.

20. *ibid.*, 19.

is described by various thinkers in the context of epistemology.²¹ Accounts that explore the role of imagination in scientific methodology are of particular interest to the present study, given Hefner's extensive use of Lakatosian frameworks, as are various theological studies of the imagination.

4.1.2 The Romantic Imagination

When it comes to questions of rationality and imagination, truth and knowing, we immediately encounter the nineteenth century Romantic movement. The Romantic tradition was in part a reaction against the "desiccating rationalism" which emptied the natural world of wonder and joy.²² According to Malcolm Guite, Enlightenment philosophers essentially divorced the imagination from reason.²³ This view is represented well in David Hume's assertion that "nothing is more dangerous to reason than the flights of the imagination."²⁴ Instead, Romantic poets championed the imagination and its connection to ultimate reality – Nigel Rapport describes this swing to imaginative insights as a "redemptive mission".²⁵ Romanticism was not restricted to poetry, rather M. H. Abrams declares it a "comprehensive intellectual tendency" that encompassed philosophy in addition to literature and had a substantial impact on political and social changes in both England and Germany in its time.²⁶ John Keats, writing about one of his own poems, described

21. Indeed, Williamson argues that it is inappropriate to begin an inquiry into the imagination with a definition, as this is to risk prejudging the results (Timothy Williamson, "Knowing by Imagining," in *Knowledge Through Imagination*, ed. Amy Kind and Peter Kung (Oxford University Press, 2016), 113).

22. Alister McGrath, *Re-Imagining Nature: The Promise of a Christian Natural Theology* (Wiley Blackwell, 2016), 48.

23. Malcolm Guite, *Faith, Hope and Poetry: Theology and the Poetic Imagination* (Ashgate Publishing, 2012), 145.

24. David Hume, *A Treatise on Human Nature*, ed. L. A. Selby-Bigge (Clarendon Press, 1888), 267. This is not to paint Hume as a rationalist, arguing as he did that reason should be subject to the passions (*ibid.*, 415).

25. Nigel Rapport, "'Imagination is the Barest Reality': On the Universal Human Imagining of the World," in *Reflections on Imagination: Human Capacity and Ethnographic Method*, ed. Mark Harris and Nigel Rapport (Ashgate, 2015), 3.

26. M. H. Abrams, *Natural Supernaturalism: Tradition and Revolution in Romantic Literature* (W. W. Norton & Co., 1971), 11. Isaiah Berlin goes as far as to describe Romanticism as "the greatest single shift in the consciousness of the West that has occurred" (Isaiah Berlin, *The Roots of Romanticism* (Princeton University Press, 1999), 1–2).

it in correspondence as “a regular stepping of the Imagination towards a Truth”.²⁷ Douglas Hedley suggests that for Wordsworth, “the poet’s imaginative capacity is dependent upon the ability to penetrate truths obscured by the more narrow constraints of physical science and to envisage the hidden shape of reality.”²⁸

In his famous defence of poetry, written in 1821, Shelley reverses earlier understandings of the relationship between reason and the imagination: “Reason is to the imagination as the instrument to the agent, as the body to the spirit, as the shadow to the substance.”²⁹ After defining poetry as the exercise of the imagination, Shelley speaks exultantly of the imaginative faculty:

Poets are the hierophants of an unapprehended inspiration; the mirrors of the gigantic shadows which futurity casts upon the present; the words which express what they understand not; the trumpets which sing to battle; and feel not what they inspire; the influence which is moved not, but moves. Poets are the unacknowledged legislators of the world.³⁰

Poet and literary critic Charles Baudelaire exalts the imagination as the “queen of truth”.³¹ For thinkers like Keats and John Henry Newman, suggests Avis, the imagination was “the power that kindles insight into reality”.³² Alison Milbank describes the Romantic project as using the imagination to “awaken in the reader this feeling of homesickness for the truth”.³³

Arguably the most important Romantic thinker when it comes to the imagination, however, is Samuel Taylor Coleridge.³⁴ Coleridge spoke of the imagination as “the

27. Letter to Taylor, January 1818 (cited in Medawar, “The Genetic Improvement of Man”, 43).

28. Douglas Hedley, “Austin Farrer’s Shaping Spirit of Imagination,” in *Scripture, Metaphysics, and Poetry: Austin Farrer’s The Glass of Vision with Critical Commentary*, ed. Robert MacSwain (Routledge, 2016), 204.

29. Percy Bysshe Shelley, “A Defense of Poetry,” in *Political Tracts of Wordsworth, Coleridge and Shelley*, ed. R. J. White (Cambridge University Press, 1953), 199.

30. *ibid.*, 206.

31. Charles Baudelaire, *Baudelaire as a Literary Critic*, trans. Francis Hyslop Jnr (Pennsylvania State University Press, 1964), 182.

32. Paul Avis, *God and the Creative Imagination: Metaphor, Symbol and Myth in Religion and Theology* (Routledge, 1999), 8.

33. Alison Milbank, “Apologetics and the Imagination: Making Strange,” in *Imaginative Apologetics: Theology, Philosophy and the Catholic Tradition*, ed. Andrew Davison (SCM Press, 2011), 33.

34. As a point of clarification, the discussion here deals only with Coleridge’s work on imagination and not the related notion of fancy. For a discussion of how imagination and fancy differ according to Coleridge, see I. A. Richards, *Coleridge on Imagination*, 2nd ed. (Routledge, 1950), chapter IV. It is also noted that Coleridge derived much of the content of his thought on imagination,

speculative reason... the power by which we produce, or aim to produce, unity, necessity and universality in all our knowledge by means of principles *a priori*”.³⁵ He famously distinguished the primary imagination – “a repetition in the finite mind of the eternal act of creation in the infinite I AM” – with the secondary imagination, in which human creativity consists of an echo of the primary imagination, allowing us to “re-create”.³⁶ Christian socialism founder F. D. Maurice, who acknowledged a significant debt to Coleridge in his own work, wrote that language may be “streaked with the light of truths just rising above the horizon”.³⁷

The Romantic movement had its excesses, however, when it came to its elevation of imagination. In Romantic thought, the imagination came to be considered the “central human faculty”, promising wholeness and redemption.³⁸ It has been argued that many of the Romantic poets saw the imagination as antithetical to reason. According to Medawar, this view saw “... the pathway of Reason being long and winding and stopping short of the summit, so that while Reason is breathing heavily there is Imagination capering lightly up the hill.”³⁹ William Blake declares “I come in the grandeur of inspiration to abolish ratiocination”.⁴⁰ Søren Kierkegaard offered an important corrective here, challenging the Romantic tendency to make an absolute out of the imagination, but also countering the Hegelian relegation of imagination to the realm of the trivial, divorced from conceptual truth.⁴¹ Medawar aims for a similar middle path in his summary of the contemporary intellectual landscape which he sought to challenge: “Our traditional views about imagination

if not the form, from the work of earlier German idealists, particularly Kant and Schelling (and Coleridge was less than meticulous when it came to acknowledging his sources). The reader is directed to Mary Warnock’s excellent work for an account of these debts in Coleridge’s thought (Mary Warnock, *Imagination* (Faber & Faber, 1976)).

35. Samuel Taylor Coleridge, *Biographia Literaria*, ed. George Watson (Dent, 1965), 160.

36. *ibid.*, 167.

37. F. D. Maurice, *Subscription No Bondage, Or the Practical Advantages Afforded by the Thirty-Nine Articles as Guides in All the Branches of Academical Education* (J. H. Parker, 1835),

40. For a discussion of Coleridge’s influence on Maurice, see Graham Neville, *Coleridge and Liberal Religious Thought: Romanticism, Science and Theological Tradition* (Tauris, 2010), 56.

38. David Gouwens, *Kierkegaard’s Dialectic of the Imagination* (Peter Lang, 1989), 16.

39. P. B. Medawar, “Science and Literature,” *Encounter* 32, no. 1 (1969), 16.

40. As cited in Gerald Holton, *The Scientific Imagination: Case Studies* (Cambridge University Press, 1978), 88.

41. Avis, *God and the Creative Imagination*, 30.

and criticism in literature and in science are based upon the literary propaganda of the Romantic poets and the erroneous opinions of inductivist philosophers.”⁴² Paul Avis, though acknowledging the shortcomings of the Romantic approach, does not discount its value for a contemporary account of the imagination. “To speak of the truth of the imagination is not to fall for the excesses of Romanticism, but to make a critical and discriminating appropriation of that tradition.”⁴³

Interpretations are mixed, however, when it comes to just how much reason is denigrated in Romantic thought, and the imagination elevated. Midgley, contrary to other opinions discussed above, argues that Wordsworth and Coleridge “went to great lengths to stress that the antithesis between thought and feeling was a false one”.⁴⁴ Imagination, rather than being the antithesis of reason, lies at the middle of a single whole incorporating both feeling and thought.⁴⁵ Coleridge describes the imagination as “that reconciling and mediating power” which incorporates both reason and the senses to produce truth-conducting symbols.⁴⁶ The faculty of reason is not the subject of ire, so much as the value of reason alone. Thus, Coleridge considers the rational instinct *in abstraction* to be the content of original temptation, essentially equating abstracted reason with original sin.⁴⁷ Cold reason (abstracted from other faculties) is associated by Coleridge with visionariness, moral indolence and hard-heartedness, and superstition in turn.⁴⁸ Neither does Wordsworth reject reason, rather he describes the imagination as “reason, in her most exalted mood”.⁴⁹

Nor is the imagination treated as a monolithic entity by the Romantics. Coleridge distinguishes between allegories (phantom proxies of unsubstantial principals) and symbols. A symbol is characterized by “the translucence of the eternal through and

42. Medawar, “Science and Literature”, 18.

43. Avis, *God and the Creative Imagination*, 30.

44. Midgley, *Science and Poetry*, 55.

45. *ibid.*, 55.

46. Samuel Taylor Coleridge, *Collected Works: Lay Sermons*, ed. R. J. White, vol. 6 (Routledge, 1972), 29.

47. Samuel Taylor Coleridge, “The Statesman’s Manual,” in *Political Tracts of Wordsworth, Coleridge and Shelley*, ed. R. J. White (Cambridge University Press, 1953), 32.

48. *ibid.*, 32–33.

49. *The Prelude*, 14:193.

in the temporal. . . . it always partakes in the reality which it renders intelligible”.⁵⁰ For Coleridge and Wordsworth, the truth-recognising capacity of the imagination is bound up with religious belief. The believer, using their imagination, is able to see objects in the secular world as they appear to everyone, but additionally “as conductors or symbols of another dimension of reality”.⁵¹

4.1.3 Imagination and Theology

Douglas Hedley reminds us that while not all of the Romantic poets operated from a Christian point of view, faith was central to Coleridge’s and Wordsworth’s understanding of the imagination.⁵² This connection between imagination, reality and religious belief has been taken up by various theologians, across a range of traditions. Malcolm Guite makes the bold assertion that:

Theology has recovered from an atomising, reductive, demythologising period and is beginning to look at the importance of imaginative shaping and symbolic apprehension in the discovery of meaning and theological truth.⁵³

Challenging earlier views, Guite suggests that “the imagination, far from being a merely subjective realm of fantasy, is, in fact, an essential instrument with which we grasp the truth.”⁵⁴

Richard Viladesau argues that a “fundamental theology” of the imagination is essential for religious paradigms to be related to truth claims and to be compatible with critical human thought.⁵⁵ He describes imagination as the “mediating moment” between intellectual insight and sense experience within a critical realist approach to knowledge.⁵⁶

50. Coleridge, “The Statesman’s Manual”, 25. Though not a Romantic writer, Le Guin makes a similar point, distinguishing between the “dead equivalence” of allegory and the “living meaning” of symbol. A symbol “is not a sign of something known, but an indicator of something not known and not expressible otherwise than symbolically” (Ursula Le Guin, “Myth and Archetype in Science Fiction,” in *The Language of the Night: Essays on Fantasy and Science Fiction*, ed. Susan Wood (Putnam, 1979), 76).

51. Hedley, *Living Forms of the Imagination*, 26. Atheism thus becomes a failure of the imagination (*ibid.*, 27).

52. *ibid.*, 2.

53. Guite, *Faith, Hope and Poetry*, 1.

54. *ibid.*, 145.

55. Richard Viladesau, *Theological Aesthetics: God in Imagination, Beauty, and Art* (Oxford University Press, 1999), 77.

56. *ibid.*, 78.

Similarly, Avis contends that the greatest truths can only be conveyed through the imagination.⁵⁷ He contrasts this with what he considers to be a false picture of rationality. “We see more profoundly into reality through the truth of imagination than we do when we pursue the illusion of precise, specifiable, purely objective, literal description.”⁵⁸ For Avis, the Christian faith is essentially held “hostage” by “the truth-bearing capacity of metaphor, symbol and myth”.⁵⁹ He explores the way in which the symbols of spirit, light and love in the Scriptures act as “windows on the transcendent” for conveying knowledge of God.⁶⁰ Although they are expressed as practical, almost concrete, symbols in the biblical text, they also function as metaphysical assertions concerning the nature of ultimate reality.⁶¹

The imagination illuminates that which cannot be known through the senses. Hedley describes the imagination as “the capacity to see the world as disclosing that which transcends the spatio-temporal”.⁶² The creative imagination is connected with divine inspiration; it is the “light and energy of the soul as it relishes truth: knowledge ‘wedded’ to feeling”.⁶³ Milbank describes a form of “magic idealism” in which we can, through imagination, “share in divine creativity by awakening the world beyond itself to its own reality”.⁶⁴

Garrett Green identifies the imagination as the “anthropological point of contact for divine revelation”.⁶⁵ It is the *Anknüpfungspunkt*, or “point of contact” between divine revelation and human experience.⁶⁶ God “gives himself to the world... by touching the human imagination...”, especially through Scripture.⁶⁷ Hans Urs von Balthasar makes the similar argument that “the biblical revelation occurs in the same formal anthropological locus where the mythopoeic imagination designed its

57. Avis, *God and the Creative Imagination*, 8.

58. *ibid.*, 11.

59. *ibid.*, 52.

60. *ibid.*, 52.

61. *ibid.*, 52.

62. Hedley, *Living Forms of the Imagination*, 22.

63. *ibid.*, 52.

64. Milbank, “Apologetics and the Imagination”, 44.

65. Garrett Green, *Imagining God: Theology and the Religious Imagination* (Harper & Row, 1989), 40.

66. *ibid.*, 5.

67. Garrett Green, *Theology, Hermeneutics, and Imagination: The Crisis of Interpretation at the End of Modernity* (Cambridge University Press, 2000), 185.

images of the eternal”.⁶⁸ Milbank is even more specific, arguing that the imagination is essentially Christological, an instrument through which God works.⁶⁹

More particularly, Frederick Hoffman argues that the Incarnation is the crucial point for the modern imagination.⁷⁰ He draws our attention to T.S. Eliot’s expression of the connection between the Incarnation and imagination in *Four Quartets*:

For most of us, there is only the unattended
Moment, the moment in and out of time,
The distraction fit, lost in a shaft of lightning
Or the waterfall, or music heard so deeply
That is not heard at all, but you are the music
While the music lasts. There are only hints and guesses,
Hints followed by guesses; and the rest
Is prayer, observance, discipline, thought and action,
The hint half guessed, the gift half understood, is Incarnation.⁷¹

Avis, too, perceives the Incarnation as the supreme validation for a realist interpretation of the symbolic.⁷² As with Romanticism, the role of symbol features prominently in subsequent theological treatments of the imagination. In the work of Karl Rahner the symbol functions as a necessary element of *Vorgriff* – it is only through the use of the symbol that we are able to reach out beyond ourselves towards our true nature.⁷³ Viladesau explores Rahner’s transcendental method, contending that the non-objective pre-apprehension of spiritual realities is synthesised by the imagination via symbols connected with sensible experience.⁷⁴

The understanding of Scripture as expressing truth through symbol enjoys a long heritage in Christian thought. Augustine, according to Carol Harrison, saw Scripture as requiring “an intuitive, imaginative, symbolic, image-making apprehension of

68. Hans Urs von Balthasar, *The Glory of the Lord: A Theological Aesthetics*, vol. 1 (T & T Clark, 1982), 145.

69. Milbank, “Apologetics and the Imagination”, 35.

70. Frederick Hoffman, *The Imagination’s New Beginning: Theology and Modern Literature* (University of Notre Dame Press, 1967), 8.

71. As cited by *ibid.*, 8; c.f. T. S. Eliot, “Dry Salvages” in *Four Quartets* (1941). Brian Horne highlights this poem as an example of how the imagination uncovers certain truths that are inaccessible to more empirical approaches (Brian Horne, *Imagining Evil* (Darton, Longman & Todd, 1996), xiii).

72. Avis, *God and the Creative Imagination*, 110.

73. Karl Rahner, *Hörer des Wortes* (Kössel-Verlag, 1963), 180n.

74. Viladesau, *Theological Aesthetics*, 82.

God's word", more akin to the expressions of a poet than to a philosopher.⁷⁵ Aquinas, too, highlights the use of bodily metaphors in Scripture to convey spiritual knowledge.⁷⁶ The imagination is thus central for scriptural hermeneutics. "For God has chosen to reveal himself not in transparent doctrines appealing to pure reason but in opaque symbols and narratives that appeal to the imagination."⁷⁷

Hoffman identifies a strong presence of the religious imagination in modern literature, "because of the need to establish new formulations of the central theological metaphors".⁷⁸ By its very nature, theological language is companion to the lyrical and the dramatic.⁷⁹ Yet we must take care not to equate Scripture with poetry generally here – Austin Farrer's account that "[biblical] inspiration stands midway between the free irresponsibility of poetical images, and the sober and critical analogies of metaphysical discourse" is helpful as we maintain this necessary distinction.⁸⁰

Ricoeur delves further into the metaphysics of the imagination in his discussion of metaphor. Though he cautions against drawing uncritically from the Romantic tradition to develop a metaphysics of imagination,⁸¹ he contends that we must follow Kant rather than Hume and "look at the imagination as the place of nascent meanings and categories, rather than as the place of fading impressions".⁸²

Green calls for theologians in postmodernity to "acknowledge unapologetically" that all religion (though he addresses himself particularly to Christian theologians) depends upon the imagination in its language, and must use the imagination to articulate this grammar.⁸³ "For God has chosen to reveal himself in the

75. Carol Harrison, *Beauty and Revelation in the Thought of Saint Augustine* (Clarendon Press, 1992), 82.

76. Aquinas, *Summa Theologiae*, Ia.1.9, *Responsio*.

77. Green, *Theology, Hermeneutics, and Imagination*, 182.

78. Hoffman, *The Imagination's New Beginning*, 16.

79. Avis, *God and the Creative Imagination*, 69.

80. Austin Farrer, *The Glass of Vision* (Dacre Press, 1948), 148.

81. Paul Ricoeur, "Creativity in Language," *Philosophy Today* 17, no. 2 (1973), 107.

82. *ibid.*, 109.

83. Green, *Theology, Hermeneutics, and Imagination*, 205.

world in a manner accessible only to imagination.”⁸⁴ McGrath expands on the importance of this exercise:

Retrieving the imaginative dimensions of theology addresses one of its most worrying blind spots – a failure to recognize that the theological landscape extends beyond the constrained and constraining domains of the cognitive and rational on the one hand, and the experiential and existential on the other.⁸⁵

Finally, Graham Ward highlights the imagination as a response to God, describing it as “that receptive capacity of the soul that responds both to a world so created and also to creation as a divine gift”.⁸⁶

4.1.4 Imaginative Science

It is perhaps unsurprising that the role of the imagination in epistemology has been attended to by theologians, given the strong narrative element of religious belief. But what of science? Scientists are often reluctant to speak of the imagination with respect to the scientific process. Scientific research is considered to be a logical, unemotional activity in which “even the exhilarating flights of intuitive imagination must be recast in deductive style to be respectable”.⁸⁷ The work of a scientist is often portrayed as purer than other endeavours, untainted by human emotions. Richard Hamer describes the physicist’s soul as “aloof from mortal strife”.⁸⁸ Mathematical physicist James Clerk Maxwell refers to:

... those illustrious men [of science] who by aspiring to noble ends, whether intellectual or practical, have risen above the region of storms into a clearer atmosphere, where there is no misrepresentation of opinion, nor ambiguity of expression, but where one mind comes into closest contact with another at the point where both approach nearest to the truth.⁸⁹

84. *ibid.*, 206. At the same time, Green cautions against the possible detrimental consequences of postmodernity for the imagination – though the imagination may emerge triumphant in the relativistic postmodern context, this triumph may be purchased at the cost of forfeiting the imagination’s grip on reality (*ibid.*, 199).

85. McGrath, *Re-Imagining Nature*, 48.

86. Ward, *Unbelievable*, 207.

87. Holton, *The Scientific Imagination*, 237.

88. Richard Hamer, “The Romantic and Idealistic Appeal of Physics,” *Science* 61, no. 1570 (1925), 109.

89. James Clerk Maxwell, inaugural lecture at Cambridge (1871), as cited in Holton, *The Scientific Imagination*, 232.

Einstein similarly speaks of the inhabitants of the “Temple of Science” – drawn to the “silent, high mountains, where the eye ranges freely through the still, pure air and traces the calm contours that seem to be made for eternity”.⁹⁰ The language used by Maxwell and Einstein has rather a Nietzschean air to it; their picture of the scientist bearing strong resemblance to the *Übermensch*.⁹¹

Yet the scientific method can be understood differently, its emphasis on rationality and freedom from subjective elements challenged. Echoing Coleridge’s objection to abstract reason, mathematician and philosopher Alfred North Whitehead also criticised “one-eyed reason, deficient in its vision of depth”.⁹² When it comes to discerning appropriate human intervention into human nature, and questioning the limits, Medawar suggests that our answer is grounded in “a certain natural sense of the fitness of things, a feeling that is shared by most kind and reasonable people even if we cannot define it in philosophically defensible or legally accountable terms”.⁹³ If we cannot articulate this sense by appeal to reason or logic, how do we access this knowledge?

Medawar, by way of an answer, first sketches out what he considers the prevailing perception of scientific enquiry – that scientific truths find their origins in unadorned sense evidence and unprejudiced observation, upon which “a great mountain of natural law is slowly built”.⁹⁴ He challenges this position, contending that “without imagination scientific thought is barren”.⁹⁵ He makes his case in part by highlighting the role played by the imagination in Popper’s scientific methodology. Scientific understanding begins with imaginative preconceptions, the “invention of a Possible World”.⁹⁶ Medawar urges scientists, and the thinking public, to view the scientific

90. Albert Einstein, “Motive des Forschens,” in *Ideas and Opinions of Albert Einstein*, ed. Sonja Bargmanns, trans. Sonja Bargmann (Crown Publishers, 1954). The translation used here is taken from Gerald Holton, *Thematic Origins of Scientific Thought: Kepler to Einstein* (Harvard University Press, 1973), 376.

91. Friedrich Nietzsche, *Thus Spoke Zarathustra*, trans. R. Hollingdale and E. Rieu (Penguin, 1961).

92. Alfred North Whitehead, *Science and the Modern World* (Free Press, 1967), 59.

93. Medawar, “Science and the Sanctity of Life”, 88.

94. P. B. Medawar, “Hypothesis and Imagination,” in *Pluto’s Republic* (Oxford University Press, 1982), 115.

95. *ibid.*, 116.

96. Medawar, “Science and Literature”, 17.

process as inspirational, not the outcome of a merely logical process: "...the Promotion of Natural Knowledge depends above all else on a *sortie* into what can be imagined but is not yet known".⁹⁷ The imaginative and critical voices are in dialogue in scientific reasoning. This is not to say that arriving at a scientific hypothesis is illogical, rather Medawar describes it as "non-logical" (i.e. outside logic), though it can be subjected to criticism and experimentation once formed.⁹⁸ Max Planck affirms the need for the scientist to possess a "vivid intuitive imagination, for new ideas are not generated by deduction, but by an artistically creative imagination".⁹⁹ Physicist and biologist Leo Szilard also highlights the inherent creativity of science:

"The creative scientist has much in common with the artist and the poet. Logical thinking and an analytical ability are necessary attributes to a scientist, but they are far from sufficient for creative work. Those insights in science that have led to a breakthrough were not logically derived from preexisting knowledge."¹⁰⁰

Hedley gives examples of how the creative imagination is at work in scientific discovery. He relates the development of relativity theory to Einstein's image of a rider with a mirror on a beam of light, the discovery of benzene's chemical structure to Kekulé's dream of a ouroboros, and Mendelée's breakthrough with the arrangement of the periodic table to his dream involving the card game *solitaire*.¹⁰¹ Speaking of both the humanities and the sciences, Hedley argues that "wonder can inspire the imagination both to operate creatively and to illuminate the structures of reality."¹⁰²

Gerald Holton, former Professor of Physics at Harvard University, and an historian of science, delves further into the process, suggesting that the imagination of a scientist is guided (perhaps implicitly) by fidelity to certain "themata", the

97. P. B. Medawar, "Imagination and Hypothesis," *The Times Literary Supplement*, 25 October 1963, , 850.

98. P. B. Medawar, *Induction and Intuition* (American Philosophical Society, 1969), 46.

99. Max Planck, *A Scientific Autobiography* (Williams & Norgate, 1950), 109.

100. As cited in Antonio Damasio, *Descartes' Error: Emotion, Reason, and the Human Brain* (G. P. Putnam's Sons, 1994), 189; c.f. William Lanouette, *Genius in the Shadows* (Charles Scribner's Sons, 1992). Animal pathologist William Ian Beveridge provides a more detailed account of the imagination's role in generating new ideas, and in effecting sudden "leaps" in scientific problem solving (W. I. Beveridge, *The Art of Scientific Investigation* (W. W. Norton & Co., 1957)).

101. Hedley, *Living Forms of the Imagination*, 67.

102. *ibid.*, 67.

nature of which is determined by the historical context and the options open to the scientist during the period in which they are researching.¹⁰³ He identifies a key characteristic of scientific enquiry – that it can often be described as “verging on a charismatic activity” – with this dependence on overarching themata.¹⁰⁴ In analysing the “event” of a scientific work, therefore, Holton identifies many factors that should be considered, including both the state of science at the time of discovery, and the scientist’s own “psychobiographical” context.¹⁰⁵ He finds that themata guiding scientific enquiry are often paired antithetically e.g. atomism vs. the continuum, which relates to “the dialectic nature of science as a public, consensus-seeking activity”.¹⁰⁶

Mathematician and chemist Charles Coulson sees the use of imagination as one of the commonalities between science and other disciplines, for the interpretation of facts is a creative act.¹⁰⁷ The guiding themata mentioned above is one aspect of this creative interpretation. Scientists also draw on metaphor in surprising ways, engaging the imagination in our understanding of various scientific concepts. Mary Midgley gives the example of the discovery of DNA and the central dogma. The selection of the terms “transcription” and “translation” to denote the process of moving from DNA to RNA to protein has contributed to the understanding of genetic material as digital information and the notion of the gene as an all-powerful controller of biological nature.¹⁰⁸

Even the perceived antagonism between the disciplines of theology and science, Midgley argues, can be traced back to imaginative beginnings, impacted substantially by the thought of Greek atomistic philosophers epitomised in Lucretius’ poem *De Rerum Natura*.¹⁰⁹ Lucretius not only, or even primarily, conceived of atomism as an answer to scientific questions, but rather applied it in the sense of “a moral crusade – the only way to free mankind from a crushing load of superstition by showing

103. Holton, *The Scientific Imagination*, viii-ix.

104. *ibid.*, xi.

105. *ibid.*, 3–5.

106. *ibid.*, 10.

107. Charles Coulson, *Science and Christian Belief* (Oxford University Press, 1955), 49.

108. Midgley, *Science and Poetry*, 4–5.

109. *ibid.*, 23.

that natural causation was independent of the gods”.¹¹⁰ Thus, Epicurean hostility toward religion was imported into the scientific attitude alongside the development of atomic theory.¹¹¹ The creative elements of science and their accoutrements appear to exert their influence beyond the process of scientific enquiry. The impact that using machine imagery to describe the world, following the invention of early complex machines such as clocks, has had on worldview is immense, particularly as machines are under human control by their very definition, to give another example.¹¹² Science, according to Midgley, cannot help but be affected by the imagination as scientific activity occurs within our larger world-pictures – the imagination pervades “the whole shape of our thinking”.¹¹³

To picture [science] as . . . a solitary example of rational thinking, standing out alone against a background of formless emotion – is to lose sight of its organic connection with the rest of our life.¹¹⁴

The picture of science as coldly rational, free from emotion and imagination runs counter to many past perceptions of the character of science. Sir Benjamin Brody, addressing the Royal Society in 1859, described how “physical investigation” (science) actually highlights the value of the imagination if properly employed, it is “that wondrous faculty which . . . properly controlled by experience and reflection, becomes the noblest attribute of man: the source of poetic genius, the instrument of discovery in Science. . . .”¹¹⁵ The kinship between science and poetry is attested in Coleridge’s abiding interest in the natural sciences – some of his poetry was even inspired in collaboration with scientist friends.¹¹⁶

Holton describes what he considers to be more balanced approach to epistemology:

110. *ibid.*, 23.

111. *ibid.*, 30.

112. *ibid.*, 25; c.f. Julien Offray de la Mettrie, *Machine Man and Other Writings*, ed. Ann Thomson (Cambridge University Press, 1996).

113. Midgley, *Science and Poetry*, 24.

114. *ibid.*, 24.

115. As cited in John Tyndall, *Scientific Use of the Imagination and Other Essays* (Longman, Greens & Co., 1872), 2.

116. Owen Barfield, *What Coleridge Thought* (Oxford University Press, 1971), 37.

We should, rather, strive to acquire a clearer notion of how actual mortal beings, with all their frailties, have managed to use both these faculties [imagination and reason] to grasp the outlines of a unique and fundamentally simple universe, characterised by necessity and harmony. Such knowledge, we may hope, can be of practical use at a time when our species seems to depend on tapping all the resources of reason for the generation of new ideas that are both imaginative and effective.¹¹⁷

4.1.5 Imagination, Reason and Belief

Moving beyond an antithetical model, Medawar posits that the imagination and reasoning are in fact synergistic.¹¹⁸ Midgley concurs, stating that “we use a haphazard mix of faculties which are not fully unified, but which give us various different sorts of useful light”.¹¹⁹ She counters rationalist reductionism with the suggestion that:

The many ways of thinking that we possess, and are always developing, are not rival alternatives. They form a potentially coherent set of tools which we always learn to use harmoniously to some extent (as carpenters do) and whose various capacities we can come to understand better with careful practice.¹²⁰

Hart cautions against treating the imagination as a faculty separable from the intellect (even if it is to exalt the imagination), avowing that “it is virtually impossible to identify any human activity or capacity from which imagination is entirely absent...”.¹²¹

Given the integrated character of cognition, imagination is therefore instrumental in what we believe. Wendell Berry suggests so, describing imagination as “a way of knowing things that can be known in no other way”.¹²² James Joyce writes of the mind writing stories “on all matters that fall under the ban of our infrarational senses”.¹²³ Graham Ward connects the imagination to belief, pointing out that our

117. Holton, *The Scientific Imagination*, 110.

118. Medawar, “Science and Literature”, 17.

119. Midgley, *Science and Poetry*, 121. Midgley’s use of the term “faculty” here is slightly problematic, as a faculty psychology model is largely rejected today.

120. *ibid.*, 127.

121. Hart, “The Glory of Imagination”, 229.

122. Wendell Berry, “God, Science, and Imagination,” in *Imagination in Place* (Counterpoint, 2010), 186. Here, we need to be careful not to treat the imagination as entirely separate from the intellect.

123. James Joyce, *Finnegans Wake* (Faber & Faber, 1939), 20.

disbelief is often suspended while our imagination is engaged.¹²⁴ Literature is a valuable resource in this respect, described by evolutionary psychologist Merlin Donald as “perhaps the most articulate source we have on the phenomenon of human experience”.¹²⁵ Terence Cave makes a similar case, arguing that literature provides us with the best evidence of how people think, and laments its neglect at the hands of cognitive scientists.¹²⁶ Berry drives home the imagination’s importance for belief:

There is always a significant difference between knowing and believing. We may know that the earth turns, but we believe, as we say, that the sun rises. We know by evidence, or by trust in people who have examined the evidence in a way that we trust is trustworthy. We may sometimes be persuaded to believe by reason, but within the welter of our experience reason is limited and weak. We believe always by coming, in some sense, to see. We believe in what is apparent, in what we can see or imagine or “picture” in our minds, in what we feel to be true, in what our hearts tell us, in experience, in stories – above all, perhaps, in stories.¹²⁷

James K. A. Smith also speaks of belief as a pre-rational undertaking. “Before we are thinkers, we are believers”.¹²⁸ John Henry Newman locates propositional reasoning as one aspect of faith among others; describing the human as a “seeing, feeling, contemplating, acting animal” he characterises real assent to belief as involving the whole person.¹²⁹

The entanglement and complementarity of imagination and reason has been emphasised by a number of past and present thinkers. For Gottfried Wilhelm Leibniz, the imagination serves to reconcile antitheses and polarities, raising dichotomies to a higher dialectic plane of understanding. According to Engell, Leibniz was the first to address the issue of how reason and the imagination relate to one another if the imagination is given due credit:

124. Ward, *Unbelievable*, 18.

125. As cited in *ibid.*, 18, c.f. Merlin Donald, *A Mind So Rare: The Evolution of Human Consciousness* (Norton, 2001), 78.

126. Terence Cave, *Thinking with Literature: Towards a Cognitive Criticism* (Oxford University Press, 2016).

127. Wendell Berry, “Paragraphs from a Notebook,” in *Our Only World: Ten Essays* (Counterpoint, 2015), 4.

128. Smith, *Desiring the Kingdom*, 43.

129. John Henry Newman, *An Essay in Aid of a Grammar of Assent* (Longman, Greens & Co., 1903), 294.

Imagination becomes the process, the dynamic or the dialectic, through which the truths of reason may be obtained and understood. Reason is thus more static; it is a 'higher' power than imagination but one fulfilled only through the active working and forms of the imagination."¹³⁰

Tyndall speaks of "that creative power in which reason and imagination are united" in his treatment of conical refraction.¹³¹ "Nourished by knowledge patiently won; bounded and conditioned by cooperant Reason, Imagination becomes the mightiest instrument of the physical discoverer".¹³² Eighteenth century poet Leonard Welsted further expressed some of the complexities of the relationship of imagination and reason:

...imagination is as much a part of reason as is memory or judgment, or rather a more bright emanation from it, as to paint and to throw light on ideas is a finer act of the understanding than simply to separate or compare them.¹³³

And, more recently, in the encyclical *Laudato Si'*, Pope Francis also calls for a broader context for reason:

It cannot be maintained that empirical science provides a complete explanation of life, the interplay of all creatures and the whole of reality. If we reason only within the confines of the latter, little room would be left for aesthetic sensibility, poetry, or even reason's ability to grasp the ultimate meaning and purpose of things.¹³⁴

Holton's objective to essentially unite imagination and reason for practical benefit is even more appropriate today as we consider the place of various human enhancement technologies in the human future.¹³⁵ The relationship between imagination and reason will be examined further in the final chapter of this work. For the present purposes, it is sufficient to give an account of the centrality of the imagination to both scientific and theological enquiry. The postmodern period has arguably seen a turn back to the imagination, a greater emphasis on the

130. Engell, *The Creative Imagination*, 30.

131. Tyndall, *Scientific Use of the Imagination*, 10.

132. *ibid.*, 6.

133. Leonard Welsted, *Title Epistles, Odes, Written on Several Subjects: With a Translation of Longinus's Treatise on the Sublime* (J. Walthoe & J. Peele, 1724), xxii.

134. Francis, *Laudato Si'* (Vatican, 24 May 2015).

135. See footnote 117 of this chapter.

alternative Romantic trajectory of thought without succumbing to its excesses. As surveyed in this chapter, various contemporary thinkers in both theology and philosophy of science are according a greater role to the imagination in epistemology. Holton, examining the thought of Newton and Einstein, suggested that they “were not satisfied with any primarily “scientific” world construction but yearned for a still grander synthesis”.¹³⁶ An understanding of the human place in ongoing evolution (and creation) requires a synthesis of knowledge from both the sciences and the humanities. Avis sums it up in his conclusion that “science, poetry and religion are all energised by the imagination and all tell us something about reality, appropriate to their various methods.”¹³⁷

4.2 Why the Imaginative Deficit in Co-Creation Accounts?

If the epistemological value of the imagination is attested in both theology and science as separate fields, we might ask why it has not received more attention in Hefner’s cross-disciplinary work. This section considers the various intellectual traditions that have shaped Hefner’s thought to offer possible reasons for his underdevelopment of the imaginative aspects of knowing.

4.2.1 The Legacy of Rationalism

Though a more imaginative reading of Popper was explored in the previous section, and its extrapolation to a Lakatosian philosophy of science proposed, this is neither the only, nor the dominant, understanding of these scientific accounts. The emphasis on rationalism in Lakatos’ work was mentioned in the previous chapter, and will be picked up again here. A comprehensive history of rationalism, and particularly the greater emphasis placed upon it in modernity, is beyond the scope of this research, however Medawar summarises the shift in the value of reason that occurred during the Enlightenment period.

136. Holton, *The Scientific Imagination*, 151.

137. Avis, *God and the Creative Imagination*, 17.

The seventeenth-century doctrine of the *necessity* of reason was slowly giving way to a belief in the *sufficiency* of reason – so illustrating the tendencies of many powerful human beliefs to develop into an extreme or radical form before they lose their power to persuade us, and in doing so, create anew many of the evils for which at one time they professed to be the remedy.¹³⁸

British historian and politician Lord Thomas Babington Macaulay represents such a view: “We cannot unite the incompatible advantages of reality and deception, the clear discernment of truth and the exquisite enjoyment of fiction.”¹³⁹ Where reason is exalted, the imagination is pushed to the margins, or even excluded from epistemology. David Gouwens describes the inability of Enlightenment thought to account for the imagination: “For rationalism, the imagination did not possess the clarity of rational ideas; for empiricism, the imagination seemed to lack the concreteness and vividness of sense-impressions.”¹⁴⁰ Samuel Johnson’s dismissal of the imagination as a “licentious and vagrant faculty, unsusceptible of limitations and impatient of restraint”,¹⁴¹ epitomises the rationalist position.

Holton traces the defence of a narrow rationality through the Popperian school to the pre-World War II logical positivists, who sought the restriction of philosophical discourse to empirically discernible statements. He considers Popper’s view that “the rationality of science presupposes a common language and a common set of assumptions which themselves are subject to conventional rational criticism” to be heavily influenced by the prewar positivist movement.¹⁴² Thus, Popper shows little interest in the creative context of scientific discovery, considering it “irrelevant to the logical analysis of scientific knowledge”.¹⁴³ Instead, he proposes to make such creative action “rationally understandable” by giving “an idealized reconstruction of

138. Medawar, “On ‘The Effecting of All Things Possible’”, 113.

139. Thomas Macaulay, “Milton,” in *Lord Macaulay’s Essays* (Longman, Greens & Co., 1905), 3f.

140. Gouwens, *Kierkegaard’s Dialectic of the Imagination*, 17.

141. Samuel Johnson, *The Rambler* (Hansard, 1810), 344–345. In fairness to Johnson, he is referring to the difficulty of categorising various types of writings due to the imagination’s “licentiousness”, rather than denigrating the faculty in a general sense. Certainly Johnson appears to portray reason as antithetical to the imagination, however J.H. Hagstrum argues that Johnson’s conception of reason diverges from the colder notion of many of his contemporaries. Instead, argues Hagstrum, Johnson at times fused the imaginative with the rational in his approach to aesthetics (J. H. Hagstrum, “The Nature of Dr. Johnson’s Rationalism,” *ELH* 17, no. 3 (1950), 202).

142. Holton, *The Scientific Imagination*, 103.

143. Karl Popper, *The Logic of Scientific Discovery* (Harper, 1965), 31.

the problem situation in which the [scientific] agent found himself”.¹⁴⁴ Midgley links Popper with positivism as well, but sees in Popper a reaction to the influence of positivism and its legitimation of Marxism and Freudianism as scientific theories.¹⁴⁵ In dismantling the scientific classification of such schools of thought, however, Popper did not challenge positivism itself, but merely portioned off all “non-scientific” claims into the vague, nonsensical category of “metaphysics”.¹⁴⁶

This is clearly a different interpretation of Popper’s thought than that offered by Medawar. Holton suggests that Popper himself was ambiguous concerning his proposal to rationally reconstruct the creative aspect of scientific discovery, later declaring the more ambivalent aim to delineate “a theory of understanding which aims at combining an intuitive understanding of reality with the objectivity of rational criticism”.¹⁴⁷

Lakatos, according to Holton, took up Popper’s proposal of rationalisation both vigorously and dogmatically.¹⁴⁸ In Lakatos’ attitude toward the history of science we can detect a fear of irrationalism; he adopts a defensive stance in order to rescue the idea of scientific progress as a product of rational methodology.¹⁴⁹ Forrai agrees with Holton, firmly locating Lakatos alongside the logical positivists in the project he terms “rationalism”.¹⁵⁰ Though Lakatos challenges the Enlightenment ahistorical notion of objectivity that is displayed in the works of both Popper and the logical positivists, a similar claim of objectivity creeps into his denouncing of scientific elitism.¹⁵¹

144. Popper, *Objective Knowledge*, 179.

145. Midgley, *Science and Poetry*, 149.

146. *ibid.*, 150.

147. Holton, *The Scientific Imagination*, 328n; c.f. Popper, *Objective Knowledge*, 190.

148. Holton, *The Scientific Imagination*, 105. Lakatos’ approach to the rational reconstruction of history, and associated criticisms, is treated in Lorrimar, “Scientific Research Programmes”.

149. Holton, *The Scientific Imagination*, 107.

150. Gábor Forrai, “Lakatos, Reason and History,” in *Appraising Lakatos: Mathematics, Methodology, and the Man*, ed. George Kampis, Ladislav Kvasz, and Michael Stöltzner (Kluwer Academic Publishers, 2002), 73.

151. *ibid.*, 79. Scientific elitism is an approach that does not distinguish “good” theories from “bad” theories by applying normative rules, but rather locates the ability to judge only with the scientific “elite”. Forrai includes Kuhn, Polanyi, and Toulmin in the group that Lakatos rejected for elitist positions (*ibid.*, 74).

Even the opponents of rationalism may have played their part in prolonging its legacy. Holton describes a conflict arising, post-World War II, between a group of writers he terms “the new Dionysians”, and a group of philosophers he designates “the new Apollonians”.¹⁵² The “intuitive” Dionysians are primarily social and cultural critics, espousing suspicion of rationality and scientific reductionism, while the “logical-rational” Apollonians (in which group Holton includes Popper and Lakatos) would restrict rationality’s meaning to “objective” mathematics and logic, and scientific consensus.¹⁵³ As is often the case with antagonists, both groups reinforce each other’s position, and “the scientist is caught between a large anvil and a fearful hammer”.¹⁵⁴ Holton describes the consequences of this conflict for ongoing attempts to understand the process of scientific enquiry:

Possibly the worst service the new Dionysians and the new Apollonians render is that their antithetical attacks continue to discredit the accommodation of the classically rationalistic with the sensualist components of knowledge.”¹⁵⁵

It is possible that Hefner’s account of humans as co-creators, expressed in the form of a Lakatosian framework, is shaped more by rationalist understandings of Lakatos than the more imaginative alternatives. Though Hefner might not be considered a rationalist personally, denying as he does the capacity of reason to attain a completely objective view of the whole of reality,¹⁵⁶ his use of Lakatos at the very least encourages him to overlook the imagination’s full value. There are strong rationalist artefacts in Hefner’s work. Midgley, to give one example, argues that the moral contractual view of rationalism does not consider humans to owe any duties to the non-human world; which perhaps begins to explain the anthropocentrism inherent in Hefner’s model.¹⁵⁷

152. Holton, *The Scientific Imagination*, 86–87. He uses these terms in the same sense as Nietzsche, rather than drawing directly on Greek mythology (*ibid.*, 324n; c.f. Friedrich Nietzsche, *The Birth of Tragedy*, trans. Douglas Smith (Oxford University Press, 2008)).

153. Holton, *The Scientific Imagination*, 86–87.

154. *ibid.*, 86.

155. *ibid.*, 109–110.

156. Hefner, *THF*, 79–80.

157. Midgley, *Science and Poetry*, 171. It cannot tell the entire story, however, because Hefner does argue that human co-creation should serve all of nature. He does, however, privilege “rational” humans as the only species capable of co-creation.

4.2.2 The Development of Science and Religion

Perhaps Hefner's particular academic environment is another factor shaping his views on rationality and imagination. Let us draw back and consider the field of science and religion as a whole, in order to better understand the context of Hefner's work.

The early shapers of the science and religion field were primarily scientists. David Tracy reminds us that in spite of the growth in "postmodern" accounts of science among philosophers of science, a degree of positivism persisted among many scientists in the period contemporary to Hefner's work.¹⁵⁸ Taede Smedes, writing on the history of the contemporary science and religion field, takes issue with the scientific notions incorporated into the field's origins. Ian Barbour is recognised as the founder of science and religion as a formal area of study.¹⁵⁹ Barbour's quest to integrate science and religion, argues Smedes, "echoes the logical positivist vision of unification and has a strong bias toward science as the sole source of rationality, which does not take theology seriously".¹⁶⁰ Considering the objectives of Barbour's landmark *Issues in Science and Religion* (1966), Smedes suggests it had the dual purpose of: (1) providing a conceptual investigation of the parallels and differences between science and theology, and (2) offering an apologetic for religion within the context of a modern, scientific culture.¹⁶¹ The aim was to restore a sense of intellectual respectability to theology, something that had been in decline since the Enlightenment period.¹⁶²

The decline of theology in the intellectual arena as a result of science's ascent has been well-canvassed. John Caputo locates the original reconfiguration of academic enquiry with Kant's conception of philosophy:

By setting philosophy up a notch, as a higher science that oversees science, setting its conditions and limits, [Kant] means to give philosophy a supervisory position, but he also effectively removes philosophy from the action, like

158. David Tracy, *The Analogical Imagination: Christian Theology and the Culture of Pluralism* (SCM Press, 1981), 343.

159. Taede Smedes, "Beyond Barbour or Back to Basics? The Future of Science-and-Religion and the Quest for Unity," *Zygon* 43, no. 1 (2008), 235.

160. *ibid.*, 237.

161. *ibid.*, 237–238.

162. *ibid.*, 238.

a restaurant critic who doesn't cook! Philosophy concerns a higher level epistemological theory of science, but it has abandoned the real world to the sciences.¹⁶³

Though Caputo is overly critical of Kant, as Kant was not reductionist in his approach to religion, Kant's distinction between the various functions of reason did effect a disengagement of religion from scientific thought. The resultant change in cultural attitudes is described by a number of historians and philosophers. Historian Owen Chadwick argues for a diminished sense of providence on the part of religious people since the Renaissance; an accompanying shift in attitudes to humanity.¹⁶⁴ Smedes terms this phenomenon "scientism as a cultural mode of thinking", defining it more fully as:

... a tacit faith or basic trust in science, an incorporation and internalization of scientific modes of thinking in our everyday-life mode of thinking – or, alternatively, the accommodation of our everyday-life mode of thinking to a scientific mode of thinking.¹⁶⁵

This cultural scientism, according to Smedes, is deeply enmeshed in the quest to integrate science and religion as conceived by the likes of Barbour.¹⁶⁶

Though Barbour adopts a critical realist position that "affirms the role of mental construction and imaginative activity in the formation of theories" in his early work,¹⁶⁷ he later takes a more assimilative approach to integrating religion and science that draws on process philosophy.¹⁶⁸ Thus, Barbour argues that religious

163. John Caputo, *Philosophy and Theology* (Abingdon Press, 2006), 29.

164. Owen Chadwick, *The Secularization of the European Mind in the Nineteenth Century: the Gifford Lectures in the University of Edinburgh for 1973-74* (Cambridge University Press, 1975), 258.

165. Smedes, "Beyond Barbour", 242.

166. *ibid.*, 242. Barbour, in defence against this charge, contends that scientism can only be understood in a more specific sense i.e. a combination of both an epistemological claim concerning scientific enquiry and an ontological claim concerning the material nature of the universe (Ian Barbour, "Taking Science Seriously Without Scientism: A Response to Taede Smedes," *Zygon* 43, no. 1 (2008), 260). Perhaps Smedes' choice of terms is not entirely prudent or fair, however Barbour's objection to the term does not automatically protect his work from the charges contained within Smedes' more broadly defined "scientism".

167. Ian Barbour, *Issues in Science and Religion* (SCM Press, 1966), 172.

168. Christian Berg, *Theologie im technologischen Zeitalter: Das Werk Ian Barbours als Beitrag zur Verhältnisbestimmung von Theologie zu Naturwissenschaft und Technik* (Kohlhammer, 2002), 70. This is despite Barbour's earlier critique of process theology for succumbing to category mistakes in their search for an overarching metaphysical scheme to unite science and religion (Barbour, *Issues in Science and Religion*, 453).

language is “noncognitive” and “no explicit propositional assertions about reality are made” in its use.¹⁶⁹ Berg reads in this view an echo of logical positivism, at least in the relegation of religion and metaphysics to a noncognitive level.¹⁷⁰ Smedes considers the cultural scientism inherent in the work of Barbour, as well as Arthur Peacocke and John Polkinghorne, to be a remnant of logical positivism. Before taking up theology, these scholars received scientific training “in an era in which the influence of logical positivism upon science was strong”.¹⁷¹

Examining the negligible impact that the science-religion dialogue concerning divine action has had on the work of contemporary systematic theologians, Smedes contends that the answers offered by said dialogue are often too scientific.¹⁷² While divine action serves as a test case for Smedes, he concludes that the field tends toward “theological naturalism”. “Science not only has become our sole heuristic instrument to tackle questions that relate to our world but has extended its reach to deal with theological questions.”¹⁷³ This constitutes a category error – “confusing the logic implicit in speaking about the natural order with the logic implicit in talking about the order of the divine”.¹⁷⁴ As a result of this kind of confused logic, Smedes argues that the science and religion field has essentially reached a “midlife crisis” – neither theologians nor scientists outside the field are taking the dialogue seriously and it has become an end in itself.¹⁷⁵

Given its origins, is not surprising that a number of thinkers in the science and religion field were drawn to the philosophy of Lakatos. We can observe the tendency to make theology conform to scientific patterns of thought and expression in the work of Hefner’s particular intellectual mentors. His use of Lakatosian research frameworks is very much in the same vein as Murphy’s major 1990 work,

169. Ian Barbour, *Religion and Science: Historical and Contemporary Issues* (HarperCollins, 1997), 158.

170. Berg, *Theologie im technologischen Zeitalter*, 151f. Smedes also finds similarities between Barbour’s approach and that of logical positivism, however he differentiates the nature of the unity that each seeks, as well as approaches to language (Smedes, “Beyond Barbour”, 251–252).

171. *ibid.*, 253.

172. *ibid.*, 245.

173. *ibid.*, 245.

174. *ibid.*, 246. Logical possibilities become collapsed into physical possibilities.

175. *ibid.*, 236.

Theology in the Age of Science. It appears that Murphy and Hefner were developing their separate interests in adopting Lakatos' thought for theological explanation at the same time, with Murphy's dissertation on Lakatos completed only a year before Hefner's first article on the subject was published.¹⁷⁶ Murphy's early work represents the more sustained engagement with Lakatos, however, and Hefner states that he follows her interpretation of Lakatos in his own monograph.¹⁷⁷ Murphy rejects critical realism, her focus instead on explanatory adequacy is in service of achieving equal epistemic status for theology and science "without the questionable invocation of a questionable philosophical doctrine".¹⁷⁸ Though she is unwilling to tether rationality to realism, as Lakatos appears to do, her emphasis on rationality in order to bring theology closer to science leaves little room for the imagination to operate in her epistemology.

Ralph Burhoe was a long time intellectual mentor to Hefner. Like Hefner, Burhoe has a strong interest in sociobiology, promulgating the theory of biocultural evolution.¹⁷⁹ Hefner, writing in memoriam of Burhoe, describes Burhoe's work as "a comprehensive explanation of how traditional religion could be translated into serious scientific theories".¹⁸⁰ Burhoe's biographer, David Breed, traces Burhoe's particular philosophy of science back to the work of Rudolf Carnap, prominent member of the Vienna Circle and author of logical positivism. The Institute for the Unity of Science, founded in 1947, grew out of the Vienna Circle's work and developed a close association with the American Academy of Arts and Sciences during Burhoe's lengthy executive tenure period with the Academy.¹⁸¹ Breed describes how "Burhoe's theological ideas began to be characterized by [the Academy's] potent scientific and

176. Nancey Murphy, "Theology in the Age of Probable Reasoning (Catholic Modernist, Jeffrey Stout, Imre Lakatos)" (PhD diss., Graduate Theological Union, Berkeley, 1987); Hefner, "Theology's Truth".

177. Hefner, *THF*, 23.

178. Nancey Murphy, "From Critical Realism to a Methodological Approach: Response to Robbins, Van Huyssteen, and Hefner," *Zygon* 23, no. 3 (1988), 288.

179. Burhoe, "Religion's Role in Human Evolution".

180. Philip Hefner, "Ralph Burhoe: Reconsidering the Man and His Vision of Yoking Religion and Science," *Zygon* 49, no. 3 (2014), 636.

181. David Breed, *Yoking Science and Religion: The Life and Thought of Ralph Wendell Burhoe* (Zygon Books, 1992), 17–18.

intellectual climate”.¹⁸² Accordingly, Burhoe sought to translate traditional religious doctrine into scientific language, to “interpret religion by using the methods and conceptual tools of the sciences”.¹⁸³

Burhoe developed his “yoking” model of science and religion in conversation with scientists such as E. O. Wilson and Donald Campbell, and we see the concerns of sociobiology reflected particularly in the centrality of trans-kin altruism in his work, a theme which Hefner also develops.¹⁸⁴ Hefner, too, expresses admiration for the work of sociobiologist E. O. Wilson. Though Wilson at times offers conflicting views of how science and religion interact, he strongly supports the scientific approach to knowledge: “Scientific materialism is the only mythology that can manufacture great goals from the sustained pursuit of pure knowledge.”¹⁸⁵ This scientific account of reality “has always, point for point in zones of conflict, defeated traditional religion”.¹⁸⁶ As Midgley reminds us, however, sociobiology is highly ideological (despite its claims to be scientific) and tends to normalise contemporary lifestyles (such as individualism) rather than describe human universals rationally on the basis of empirical evidence.¹⁸⁷ Sociobiologists are generally guided by the same atomistic world view discussed earlier in this chapter.¹⁸⁸

4.2.3 Theological Heritage

While Hefner’s understanding of science offers some insights into the imaginative deficit in his work, we might also seek explanations in his theological commitments. Apart from the imaginative discourse of Romanticism and German Idealism, we can trace a very different understanding of imagination through the modern period. In stark contrast to the value placed on imagination by Romantics and Idealists, other thinkers denied a place for imagination in epistemology entirely.

182. *ibid.*, 13.

183. *ibid.*, 19; c.f. Ralph Burhoe, “The Concepts of ‘God’ and ‘Soul’ in a Scientific View of Human Purpose,” *Zygon* 8 (1973), 438; Ralph Burhoe, “The Human Prospect and the ‘Lord of History’,” *Zygon* 10 (1975), 330.

184. Ralph Burhoe, “War, Peace and Religion’s Biocultural Evolution,” *Zygon* 21, no. 4 (1986).

185. Wilson, *On Human Nature*, 207.

186. *ibid.*, 192.

187. Midgley, *Science and Poetry*, 153.

188. *ibid.*, 199.

Green locates the turn away from the imagination with Ludwig Feuerbach, whom he credits with initiating the “hermeneutics of suspicion” identified and named by Ricoeur.¹⁸⁹ Feuerbach is largely overlooked, argues Green, however he influenced the recognised “masters of suspicion” (Marx, Nietzsche and Freud) and his thought still shapes religious interpretation today.¹⁹⁰ Very much a positivist in his own epistemology, Feuerbach “always takes for granted . . . the axiom that *imagination* and *reality* comprise an unproblematic duality, that they are opposed and mutually exclusive terms”.¹⁹¹ So when Feuerbach identified the imagination as the “original organ of religion”, and described religion as the product of the imagination, he thus connected suspicion with imagination.¹⁹² Feuerbach takes Hegel’s dialectic of *Vorstellung* and *Begriff*, but instead of seeking synthesis in a higher plane he separates imagination and reason entirely, associating the latter with reality and relegating the former to illusion.¹⁹³ Viladesau suggests that this move of Feuerbach’s set the stage for positivism in the Victorian era.¹⁹⁴ Describing the same move, Iain McGilchrist argues that Feuerbach and the other “young Hegelians” destroyed the bridge between the realms of sensory experience and concepts or ideas, thus reducing complex experience to a material view of reality.¹⁹⁵ It is worth considering, therefore, how much these theological schools of thought contributed to Hefner’s intellectual formation.

Process theology leaves clear footprints in Hefner’s writing. His conception of human nature as “endless becoming” in particular lends itself to this interpretation of his work. Hefner affirms many aspects of process theology, contending that the likes of Whitehead and Charles Hartshorne have “established in a determinative

189. Green, *Theology, Hermeneutics, and Imagination*, 84.

190. *ibid.*, 84.

191. *ibid.*, 92.

192. *ibid.*, 92–93.

193. *ibid.*, 94; c.f. Ludwig Feuerbach, *The Essence of Christianity*, trans. George Eliot (Harper & Row, 1957), 214. In fact, the original German reads “Die Phantasie ist das ursprüngliche Organ und Wesen der Religion”, thus Feuerbach identifies imagination not only as the organ of religion, but also its essence (Ludwig Feuerbach, *Das Wesen des Christentums* (Wigand, 1841), 318).

194. Viladesau, *Theological Aesthetics*, 62.

195. Iain McGilchrist, *The Master and his Emissary: The Divided Brain and the Making of the Western World* (Yale University Press, 2009), 383.

manner how this world's processes can unfold within God without compromising his divinity".¹⁹⁶

Perhaps surprising, given he does not address the role of the imagination directly in co-creative activity, is the reference Hefner makes to the work of Ricoeur. The extent to which Hefner has read and engages with Ricoeur's wider thought is unclear, but he does adopt Ricoeur's view of religious myth and the interpretation of the human condition in biological categories.¹⁹⁷ He sympathises with and describes the theological task set by Ricoeur:

... to transport the original symbols, where they are important vessels of information for us, into the realm of contemporary, second-naiveté experience, and enable them to coalesce with our experience to provide genuine knowledge of reality...¹⁹⁸

Ricoeur represents a very different tradition to the logical positivist movement already discussed. He sees instead a "surplus of meaning", and explores the idea of the productive imagination and its relationship to reality.¹⁹⁹ George Taylor, referring to unpublished lectures by Ricoeur on the imagination, suggests that the imagination is "connected with an ontology" in Ricoeur's thought.²⁰⁰

Hefner attempts to unite two quite disparate approaches. On the one hand, he sets out to articulate theology within a scientific framework that purports to be highly rational according to its author and to other theologians who have adopted it. As discussed earlier, however, the epistemic value of Lakatos' model is contentious, and Lakatos' claim of epistemological realism is self-referential. Hefner describes himself as a "hopeful" critical realist – hopeful because he does not believe there to be a conclusive philosophical argument in favour of critical realism.²⁰¹ In following Ricoeur's understanding of myth, he attempts to wed this problematic scientific realism with a linguistic coherentist position.

196. Hefner, "The Foundations of Belonging", 169.

197. Hefner, *THF*, 21, 123, 138; c.f. Paul Ricoeur, *The Symbolism of Evil* (Beacon Press, 1967), 3–18.

198. *THF*, 142.

199. Paul Ricoeur, "The Function of Fiction in Shaping Reality," *Man and World* 12, no. 2 (1979), 128.

200. George Taylor, "Ricoeur's Philosophy of Imagination," *Journal of French Philosophy* 16, no. 1 (2006), 98.

201. Hefner, *THF*, 220.

The reasons offered here for the underdevelopment of the imagination in Hefner's work are largely speculative. It may simply be a result of Hefner giving little attention to epistemology and metaphysics overall that we see this gap in his work. He draws on vastly different schools of thought, and it is difficult to ascertain how critically he approaches each position, or how he reconciles them into a single coherent framework.

4.2.4 Lakatos and Imagination

Neil Calver describes Medawar's reading of Popper, and accompanying conception of the scientific process, as a liberating one – “one that enlarged and was not diminished by the thought that any truth begins life as an imaginative preconception of what that truth might be”.²⁰² But does this extend to scientific methodologies beyond that described by Popper? Whereas Popper suggested that the process of arriving at new conjectures in scientific discovery cannot be analysed rationally, Lakatos argued for “a rational and non psychologistic [*sic*] heuristic providing a guideline, a set of instructions, from the criticism of an old conjecture to the “discovery” of a new, improved one”.²⁰³ Motterlini makes a convincing case, however, that Lakatos oscillated in his thought between a Hegelian understanding of method as an objective surrogate for truth, and an appeal to Popperian fallibilism and rejection of the absolute “cunning of reason”.²⁰⁴ In the latter, at least, there is perhaps room to read Lakatos in a way that leaves room for the operation of the imagination, as Medawar does with Popper. Writing to colleague Adolf Grünbaum, Lakatos concedes “there is no ultimate proof that ... we have been heading towards the Truth. We can only (non-rationally) believe, or, rather hope, that we have been”.²⁰⁵

A strong case can be made, therefore, for the importance of the imagination in both the worldview underpinning the work of a scientist, and the inspiration phase

202. Neil Calver, “Sir Peter Medawar: Science, Creativity and the Popularization of Karl Popper,” *Notes and Records: The Royal Society Journal of the History of Science* 67 (2013), 308.

203. Matteo Motterlini, “Professor Lakatos Between the Hegelian Devil and the Popperian Deep Blue Sea,” in *Appraising Lakatos: Mathematics, Methodology, and the Man*, ed. George Kampis, Ladislav Kvasz, and Michael Stöltzner (Kluwer Academic Publishers, 2002), 27.

204. *ibid.*, 45.

205. Imre Lakatos, “Anomalies Versus ‘Crucial Experiments’ (a Rejoinder to Professor Grünbaum),” in *Mathematics, Science and Epistemology: Philosophical Papers*, ed. John Worrall and Gregory Currie, vol. 2 (Cambridge University Press, 1978), 223.

of scientific enquiry. Williamson suggests that the imagination's role in science extends beyond the discovery phase, arguing that mathematicians often appeal to the imagination in order to justify their first principles.²⁰⁶ While the imagination may have been implicated in exacerbating the conflict thesis of science and religion, it offers far greater resources for harmonising the two pursuits. Einstein was cited earlier, concerning the lofty pursuits undertaken in the "Temple of Science". Yet Einstein does not consider this rarified mountain atmosphere the domain of scientists alone.

Man seeks to form for himself, in whatever manner is suitable for him, a simplified and lucid image of the world, and so to overcome the world of experience by striving to replace it to some extent by this image. This is what the painter does, and the poet, the speculative philosopher, the natural scientist, each in his own way. Into this image and its formation, he places the center of gravity of his emotional life, in order to to attain the peace and serenity that he cannot find within the narrow confines of a swirling, personal experience.²⁰⁷

Chapter Conclusion

Filling in the historical context to the role of the imagination in epistemology is helpful for understanding contemporary theological responses to the possibility of human enhancement. We currently inhabit a time where confidence in human malleability is higher than ever (see chapter two), while the imagination (in some fields of scholarship at least) receives little attention in approaches to truth and knowing. It should be stressed that these two historical trends described – the increase in human malleability and the overlooking of the imagination – are not represented here as causally linked, or even correlates with one another (though a study of how both relate to the development of modern science would perhaps be illuminating). For the present purposes, however, they are two separate strands of history that collide in the contemporary co-creation theology exemplified by Hefner. It has been demonstrated that such theologies privilege human rationality in the

206. Williamson, "Knowing by Imagining", 122.

207. Einstein, as cited in Holton, *Thematic Origins*, 378.

exercise of co-creative agency, resulting in a diminished sense of limits to human creativity, and a somewhat vague treatment of human discernment.

We may read in these contemporary theologies of co-creation a continuation of the modernist elevation of empirical reasoning, rather than the alternative Romantic and Idealist conception of imagination. It has been shown already how Hefner depends on a Lakatosian understanding of science in the explication of his theology, a framework which has been widely and convincingly critiqued for overstating the capacity of rationality. Yet we see also in these theological thinkers an acknowledgement that the imagination has something to offer, that it represents an important resource in the development of their ideas. The historical context of the present chapter offers one explanation for the friction between the intuitions of key science and religion thinkers in favour of imagination and their stated objectives to present theology in scientifically commensurate ways. Their work is undergirded by epistemological assumptions that leave little room for the imagination in robust intellectual discourse. Their sense of imagination's importance cannot gain purchase in the science and religion dialogue model that they have inherited and therefore it remains underdeveloped in their work.

This chapter has indicated that an alternative reading of Lakatos might be possible – one that makes room for the imagination in the process of scientific enquiry. If we approach Hefner's appropriation of Lakatosian research programmes with this in view, then the theological claims he sketches out need not be subjected to rationality as the final arbiter. The strictures of empirical falsification might be relaxed with respect to theological claims, without relinquishing the explanatory power of the research programme. This would in turn give Hefner the freedom to develop his account of the imagination in epistemology, present in embryonic form through his use of poetry for illustration and his Ricoeurian approach to myth.

A deficit of imagination is rooted in the larger field of science and religion. Hefner simply has not found adequate conceptual tools to answer the questions he has about human agency and responsibility in the context of evolutionary science. With science given heuristic priority over theology from the outset in

the study of science and religion, Hefner has essentially inherited a number of category mistakes from his predecessors.

The central question of the present work is to consider how a greater focus on imagination might equip and expand current theological responses to the challenges of human enhancement. In the first chapters we saw how vital the imagination is for transhumanist visions of the future, inspiring both technological innovation and fictional explorations of technologically-enhanced humanity. Might not according equal weight to the imagination yield fruitful responses to such visions? The following chapter will consider the potential contribution that J.R.R. Tolkien's notion of sub-creation might make to a theological treatment of human enhancement, emphasising as it does the role of the imagination for guiding creative activity. Following this analysis, approaches to epistemology that accord sufficient attention to both the imagination and reason, and present an integrated account of cognition and understanding, will be explored as part of a broader theological anthropology that can engage human enhancement debates.

How cold the vacancy
 When the phantoms are gone and the shaken realist
 First sees reality. The mortal no
 Has its emptiness and tragic expirations.
 The tragedy, however, may have begun,
 Again, in the imagination's new beginning,
 In the yes of the realist spoken because he must
 Say yes, spoken because under every no
 Lay a passion for yes that had never been broken.

— Wallace Stevens

5

Humans as Sub-Creators

Contents

5.1	Why Tolkien?	166
5.2	Tolkien's Sub-Creation	167
5.2.1	The Theory of Sub-Creation	167
5.2.2	Sub-Creation in Tolkien's Narrative	172
5.3	Tolkien's Sources	176
5.3.1	Theological	176
5.3.2	Philological/Literary	182
5.3.3	Philosophical	187
5.3.4	Personal	189
5.4	Sub-creation and Reality	191
5.4.1	Narrative	198
5.4.2	What Is the Good Life?	207
5.5	Sub-Creation as a Response to Human Enhancement Issues	209
5.6	Tolkien's Sub-creation vs. Hefner's Co-Creation	210
5.7	Tolkien and Technology	212
5.7.1	Theology and the Moral Imagination	219

Chapter Overview

Hefner's account of co-creation, while strong in its engagement with science and technology, suffers an imaginative deficit. This chapter aims to bring the insights from the previous chapter on the epistemological role of imagination into the

discussion of human creative agency by considering the alternative theory of co-creation offered by writer and philologist J. R. R. Tolkien. An exposition of Tolkien's "sub-creation" is provided, particularly its outworking in his narrative works, his various intellectual and personal influences are explored, the broader context of fiction and the moral imagination is established and Tolkien's proposal is evaluated in light of what it might add to the engagement of co-creation theology with questions of human technological enhancement.

5.1 Why Tolkien?

Though his model relies more on rationalist philosophies of science than on imaginative traditions, Hefner does acknowledge the need for storytellers and poets as his model is implemented and as we ponder the future. Evolution may have entered the "phase of poetry", according to Hefner, in which "imaginative frameworks of meaning" will further nature's project.¹ Hefner wrote these words much later in his career; we may even think of them as an addendum to his created co-creator anthropology. If we are to develop his thought along the lines that he signals here, however, then we ought to turn our attention to the potential role of imagination and narrative in a theology of co-creation.

As a storyteller concerned with ideas of co-creation, Tolkien is a natural place to begin. Trevor Hart, drawing on Tolkien's correspondence, argues that Tolkien's complete oeuvre was animated by a sustained effort to answer a question that is also of central concern to the present project: "if human artistry is creative and powerful, what relationship does it have to that other "creativity" which Christian faith ascribes properly to God alone?"² Tolkien's proposals will be examined here to determine whether his notion of artistry and sub-creation might be expanded

1. Hefner, "A Fuller Concept of Evolution", 307.

2. Trevor Hart, "Tolkien, Creation, and Creativity," in *Tree of Tales: Tolkien, Literature and Theology*, ed. Trevor Hart and Ivan Khovacs (Baylor University Press, 2007), 40. Tolkien acknowledges as much himself, writing that his *Legendarium* is "fundamentally concerned with the relation of Art (and Sub-creation) and Primary Reality" and "Creation to making and sub-creation" (*Letters*, 145n, 188).

to incorporate technological development, and thus inform theological reflection on human enhancement.³

5.2 Tolkien's Sub-Creation

The first thing to note is that Tolkien's proposal of sub-creation is not articulated with anywhere near the amount of detail that scaffolds Hefner's created co-creator. It is primarily concerned with the production of art, particularly the writing of fiction, and the relationship of this type of creativity to divine creation. The major sources for understanding Tolkien's idea of sub-creation are his essay "On Fairy-Stories", the poem "Mythopoeia", and the short story *Leaf by Niggle*, collected together in the 1988 edition of the volume *Tree and Leaf*.⁴ Tolkien's fictional creation myth, the "Ainulindalë", which opens *The Silmarillion*, is another important writing, offering an illustration of Tolkien's sub-creation theory. Indeed, all of Tolkien's fictional *Legendarium* may be viewed as the practical demonstration of Tolkien's views expressed most theoretically in "On Fairy-Stories", as Tolkien himself characterises his fantasy writings thus.⁵ Tolkien's theoretical exposition will be considered first,⁶ before turning to the more plentiful fictional works and their contribution to our understanding.

5.2.1 The Theory of Sub-Creation

The lecture "On Fairy-Stories" is a defence of fantasy against various literary theories of the time, and the source in which Tolkien is most explicit about the

3. "Sub-creation" will be used throughout instead of "subcreation" to respect Tolkien's original use. Tolkien often divided words to draw attention to their compound nature and their etymology (for a discussion of this particularity of language in Tolkien see Clyde Northrup, "J. R. R. Tolkien's 'Lecture On Fairy-Stories': The Qualities of Tolkienian Fantasy" (PhD diss., University of Nevada, 2004), 134–135).

4. "On Fairy-Stories" was originally delivered as part of the Andrew Lang Lecture series at the University of St Andrew's, Scotland, in 1939. "Mythopoeia" was written in 1931 and dedicated to C.S. Lewis, in response to a discussion between the two men concerning myth and truth. *Leaf by Niggle* was written around 1938–39, though was not published until 1947.

5. *Letters*, 188.

6. The poem "Mythopoeia" will be considered as a theoretical source rather than a narrative account, as the context in which it was written indicates that it expresses Tolkien's real views without being part of an invented world. Of course, the challenges of interpreting poetry still apply and therefore caution is warranted.

topic of sub-creation. The term first arises in a discussion of the invention of the adjective, and the attendant capacity this afforded the imagination.

When we can take green from grass, blue from heaven, and red from blood, we have already an enchanter's power – upon one plane; and the desire to wield that power in the world external to our minds awakes... We may put a deadly green upon a man's face and produce a horror; we make the rare and terrible blue moon to shine; or we may cause woods to spring with silver leaves and rams to wear fleeces of gold, and put hot fire into the belly of the cold worm. But in such 'fantasy', as it is called, new form is made; Faërie begins; Man becomes a sub-creator.⁷

The use of the term Faërie is complicated, and Tolkien agonises over the precise relationship and distinction between it and terms such as Magic and Enchantment;⁸ as such, definitions will not be attempted here. The main point is that sub-creation in this first instance of its use describes the imaginative use of language to devise new forms, which can be presented to the imagination of others in writing. Later Tolkien describes the work of a successful sub-creator: "He makes a Secondary World which your mind can enter. Inside it, what he relates is 'true', it accords with the laws of that world."⁹ Sub-creation is the product of art and the imagination to give the "inner consistency of reality" i.e. to command secondary belief.¹⁰

Where the notion of sub-creation is of particular interest in the current project is in its connection to divine creation. Biographer Humphrey Carpenter captures a key aspect of what sub-creation means for Tolkien in his account of Tolkien and Lewis' well-known conversation concerning the truth of myth, recording Tolkien's claim that "not only the abstract thoughts of man but also his imaginative inventions must originate with God, and must in consequence reflect something of original truth."¹¹ Tolkien uses several metaphors that are helpful for understanding his views on how sub-creation relates to the creation of God. One example is his metaphor of refracted light, used in the poem "Mythopoeia."

7. *OFS*, 23.

8. *OFS*, 10, 53.

9. *OFS*, 37.

10. *OFS*, 47.

11. Humphrey Carpenter, *The Inklings* (Allen & Unwin, 1978), 43.

Man, Sub-creator, the refracted light
 through whom is splintered from a single White
 to many hues, and endlessly combined
 in living shapes that move from mind to mind.¹²

We humans act as crystals – we do not generate light on our own, but instead draw upon God’s light. Yet from that light we are able to produce something new after a fashion, a particular hue that would not exist apart from us. Flieger interprets the metaphor of “splintering light to many hues” as “splintering original perception into many concepts and words”.¹³ In this way, the imagination is used to “particularize and make manifest fragments of original truth”.¹⁴ The splintering of light to many hues refers to the use of words imaginatively, in the making of secondary worlds, and in the process “expressing some fragment of divine truth through fantasy”.¹⁵ Flieger credits a high degree of influence over Tolkien’s thought to Owen Barfield here, and his theory of semantic unity.¹⁶

Carpenter summarises what he believes to have been Tolkien’s meaning when using the “splintered light” metaphor:

We have come from God, and inevitably the myths woven by us, though they contain error, will also reflect a splintered fragment of the true light, the eternal truth that is with God. Indeed, only by becoming a ‘sub-creator’ and inventing stories, can Man ascribe to the state of perfection that he knew before the Fall. Our myths may be misguided, but they steer however shakily towards the true harbour, while materialistic ‘progress’ leads only to a yawning abyss and the Iron Crown of the power of evil.¹⁷

Gergely Nagy unpacks the “splintered light” metaphor further, arguing that the light of Ilúvatar in Tolkien’s *Legendarium* stands for meaning itself, a meaning that “splinters and fragments through the history of the ages of the fictitious world”, and to which cultures of Middle-earth have access in varying degrees.¹⁸

12. “Mythopoeia”, 87.

13. Verlyn Flieger, *Splintered Light: Logos and Language in Tolkien’s World* (Kent State University Press, 2002), 47.

14. *ibid.*, 47.

15. Verlyn Flieger, “Barfield’s ‘Poetic Diction’ and Splintered Light,” *Studies in the Literary Imagination* 14, no. 2 (1981), 52.

16. The influence of Barfield will be considered further in the next section.

17. Humphrey Carpenter, *J. R. R. Tolkien: A Biography* (Allen & Unwin, 1977), 147.

18. Gergely Nagy, “Saving the Myths: The Re-Creation of Mythology in Plato and Tolkien,” in *Tolkien and the Invention of Myth: A Reader*, ed. Jane Chance (University of Kentucky Press, 2004), 93.

Tolkien uses a similar metaphor in “On Fairy-Stories” when he refers to the “effoliation of creation”.¹⁹ The hints around this particular metaphor of how sub-creation might correspond to our own world will be explored later, however Tolkien returns frequently to language of trees and leaves in his ideas that human creativity elaborates on what God has made. Both of these metaphors thus convey something essential to Tolkien’s position: human creativity derives from, and builds on, divine creation. “We make still by the law in which we’re made”, he writes in “Mythopoeia”.²⁰

Trevor Hart explores the key question raised by mention of sub-creation – how does it relate to divine creation? Is human creating genuinely “creative”, or is it simply mimetic?²¹ Hart describes sub-creation as depicted in the *Silmarillion* as “the participation in God’s creative activity by angelic beings whose own mode of creativity is decisively marked by the fact that they are, in their turn, God’s creatures rather than his divine counterparts”.²²

There is a sense, however that sub-creation involves the making of something new. Greene argues that Tolkien “felt that he was contributing to the effoliation of Creation by making things that were possible to God but not actually made by him”.²³ Hart also agrees, suggesting that when the Ainur join in with Ilúvatar’s melody, “each is invited to bring into existence something that has hitherto enjoyed no existence, and thereby to enhance the overall sound of the music”.²⁴ We can see parallels with Joseph Addison’s assertion that the imagination “makes additions to Nature, and gives greater variety to God’s works”.²⁵ Randel Helms makes an even stronger case for the high value and originality of human creativity in Tolkien’s work. Placing him in the company of Coleridge and Blake, Helms argues that they

19. *OFS*, 73.

20. “Mythopoeia”, 87.

21. Hart, “Tolkien, Creation, and Creativity”, 40.

22. *ibid.*, 48.

23. Deirdre Greene, “‘Higher Argument’: Tolkien and the Tradition of Vision, Epic, and Prophecy,” *Mythlore* 21 (1996), 48–49.

24. Hart, “Tolkien, Creation, and Creativity”, 46.

25. Joseph Addison, “Pleasures of the Imagination,” in *The Spectator*, ed. Donald Bond (Oxford University Press, 1965), 3:579.

... firmly identified themselves as Christians and went to the Bible as a prime source of critical authority for their notion that human creativity, which is real and to be religiously cultivated, is, more than just an imitation of divine creativity, to some greater or lesser extent, *equivalent* to it.²⁶

Clarifying the originality of human creativity, given how Coleridge's Primary and Secondary Imaginations are often understood, Helms argues that "it is not that the human products of imagination are imitations of God's works, but that the human creative power itself is a repetition of, a small example of, the divine power."²⁷

Whether sub-creation produces something new hinges on how we understand "new". Joanny Moulin contends that Tolkien avoids any interpretation of sub-creation as creation *ex nihilo* in his emphasis on the organic growth of fantasy out of the soils of tradition – summed up by his image of the "Tree of Tales".²⁸ Tolkien differentiates between our creating and God's creation on this basis. While we cannot design a new leaf entirely, he writes, "each leaf... is a unique embodiment of the pattern" and "Spring is, of course, not really less beautiful because we have seen or heard of other like events".²⁹ Sub-creation is rather the fulfilment of latent possibilities, present from the first creation.³⁰ Sub-creation is also linked to a regaining of knowledge, a "recollection of what we have always known but have forgotten how to see".³¹

Of course, Tolkien's views on sub-creation must fall within a broader doctrine of creation. Donald Williams suggests that Tolkien grounds a resistance to reductionism into the very *createdness* of the world and of humans.³² Williams draws on Francis Schaeffer to make a connection explicit that he believes that Tolkien would affirm: "we are such irrepressible inventors and expressors of ourselves because

26. Randall Helms, "All Tales Need Not Come True," *Studies in the Literary Imagination* 14, no. 2 (1981), 40.

27. *ibid.*, 41.

28. Joanny Moulin, "J. R. R. Tolkien's 'Eucatastrophe,' or Fantasy as a Modern Recovery of Faith," in *Re-Embroidering the Robe: Faith, Myth and Literary Creation since 1850*, ed. Suzanne Bray, Adrienne Gavin, and Peter Merchant (Cambridge Scholars Publishing, 2008), 78.

29. J. R. R. Tolkien, "On Fairy-Stories," in *Tree and Leaf* (HarperCollins, 2001), 56–57.

30. Hart, "Tolkien, Creation, and Creativity", 52.

31. Flieger, *Splintered Light*, 25.

32. Donald Williams, *Mere Humanity: G. K. Chesterton, C. S. Lewis and J. R. R. Tolkien on the Human Condition* (B & H Publishing, 2006), 44.

we are made in the image of the Creator".³³ Here there are resonances with the theological analogies between human and divine creativity offered by Maritain and Sayers, near contemporaries of Tolkien, as described in chapter two.

5.2.2 Sub-Creation in Tolkien's Narrative

Perhaps one of the greatest differences between Tolkien's sub-creation and Hefner's co-creation is Tolkien's extensive use of narrative to convey his understanding of creativity. Indeed, we may view Tolkien's legendarium in its entirety as an exercise in sub-creation,³⁴ however the concept is illustrated as well through particular aspects of his tale. Accordingly, this section will examine several characters and events from Tolkien's fictional writings that elucidate his thought on sub-creation.

The Ainulindalë myth tells the story of Ilúvatar (the one sovereign god), and his creation of the Ainur (demi-gods) within his creation of Middle-earth.³⁵ Using the metaphor of making music, Tolkien sketches a participatory model of creativity, with Ilúvatar inviting the Ainur to add their own artistic efforts in adornment to his major music theme. The resultant harmony is a development of Ilúvatar's original theme i.e. the Ainur do not create in the same way as Ilúvatar but rather ornament his creation.³⁶ Nevertheless, the Ainur are able to make a distinct contribution to Ilúvatar's creation and are given both freedom and responsibility to do so.³⁷ In Tolkien's mythology, however, humans are granted further creative responsibility even than the Ainur.

"... but to Men I [Ilúvatar] will appoint a task and give a great gift". And he devised that they should have free will and the power of fashioning and designing beyond the original music of the Ainu, that by reason of their operations all things shall in shape and deed be fulfilled, and the world that comes of the music of the Ainu be completed unto the last and smallest.³⁸

33. Williams, *Mere Humanity*, 44; c.f. Francis Schaeffer, *Art and the Bible* (InterVarsity Press, 1973), 34–35. Certainly Tolkien makes this claim with respect to Fantasy (*OFS*, 56).

34. Tolkien interprets his mythology using the terminology of *OFS* (*Letters*, 284).

35. *Silmarillion*, 15–22.

36. Hart, "Tolkien, Creation, and Creativity", 44.

37. *ibid.*, 51.

38. This is the earliest version of Tolkien's myth, found in J. R. R. Tolkien, *The Book of Lost Tales, Part I*, ed. Christopher Tolkien (Houghton Mifflin, 1986), 61. Hart demonstrates that the original drafts of the Ainulindalë represented the contribution of creaturely artistry and creation to God's world in stronger terms (Hart, "Tolkien, Creation, and Creativity", 50).

Flieger contends that Tolkien envisioned a clear “apotheosis in which the discord of the original Music would be harmonized in the Second Music, which explicitly includes Men in its performance”.³⁹ Tolkien wrote that the making of elves and humans in his creation myth was intended “partly to redress the evil of the rebel Melkor, partly for the completion of all”.⁴⁰ While the myth is told from the elves’ point of view, and does not concern itself with human activity, the creativity of the Ainur remains subordinate to that of Ilúvatar. They require his endorsement of their efforts and his speaking them into existence; until Ilúvatar pronounces “*Eä!* Let these things Be!” the Ainur’s inventions exist only in their imaginations.⁴¹

Perhaps the neatest illustration of sub-creation is given in *Leaf by Niggle*, usually interpreted as a biographical allegory.⁴² Niggle is a painter, absorbed with an ever-expanding vision for his artwork, and resentful of the mundane intrusions on his time by visitors and necessary errands. From the very beginning we know that he is soon to depart on a long journey (death), and his garden remains neglected even as he despairs of finishing his painting. One particular painting becomes all-consuming, though he does divert his attention (albeit reluctantly) to fulfil his neighbourly obligations. When Niggle finally, belatedly, embarks on his required journey, he finds his meagre attempts at art realised in glorious actuality, made all the better by the collaborative efforts of his gardener neighbour. Yet the painting he made during his life is credited as a true glimpse of the ultimate splendour that was to come.⁴³ We see, therefore, a correspondence between sub-creation and a type of continuing creation (the phrase “effoliation of creation” seems particularly apt in this context). Tolkien’s hopes for sub-creation and its realisation will be explored further later in this chapter.

39. Verlyn Flieger, “The Music and The Task: Fate and Free Will in Middle-Earth,” in *Green Suns and Faerie: Essays on J. R. R. Tolkien* (Kent State University Press, 2012), 36.

40. *Letters*, 147.

41. *Silmarillion*, 20.

42. Tom Shippey, *J. R. R. Tolkien: Author of the Century* (Houghton Mifflin, 2002), 266–277. Shippey interprets it as an expression of Tolkien’s guilt over neglecting his academic writing and publishing for his writings on Middle-earth, as well as both his fears and hopes for the fantasy that so occupied his time (*ibid.*, 272–273).

43. *LBN*, 115.

The Limits of Sub-Creation

We can also best understand the *limits* of sub-creation by reference to Tolkien's stories. Shippey points out that, for Tolkien, creative urges run along a spectrum from Melkor's entirely self-centred impulse (which Tolkien equates with the work of a "magician"), to wholly legitimate avenues (fantasy and sub-creation).⁴⁴ These are not easily distinguished, and can shade into each other.⁴⁵ Hart terms both ends of the spectrum as sub-creation, which can take the form:

both of a responsible and respectful creativity – making music in accord with Ilúvatar's own design and the fruitful possibilities pregnant within it – in which creaturely vocation is, as it were, fulfilled; and an irresponsible and disrespectful (insubordinate) "creativity" that, in its pursuit of autonomy and self-glorification, succeeds only in a temporary spoiling of what Ilúvatar has made.⁴⁶

Melkor, one of the Ainur, most clearly represents the perils of sub-creation if misused. After describing the musical harmony created by Ilúvatar together with the Ainur, Tolkien continues:

But as the theme progressed, it came into the heart of Melkor to interweave matters of his own imagining that were not in accord with the theme of Ilúvatar; for he sought therein to increase the power and glory of the part assigned to himself.⁴⁷

Ilúvatar and Melkor engage in a duel of sorts, Melkor weaving discord into the melody and Ilúvatar responding with new themes that restored harmony, incorporating the "most triumphant notes" of Melkor into Ilúvatar's own solemn pattern.⁴⁸ Ilúvatar is able to redeem Melkor's attempts at disharmony using his own superior skills and the music ceases in abrupt victory. Melkor oversteps the bounds in aspiring to a "creativity like unto Ilúvatar's own".⁴⁹

In *The Lord of the Rings*, it is Saruman who offers the clearest example of sub-creation gone awry. His domain, Isengard, is described thus:

44. Shippey, *J. R. R. Tolkien: Author of the Century*, 241.

45. *ibid.*, 241.

46. Hart, "Tolkien, Creation, and Creativity", 46–47.

47. *Silmarillion*, 16.

48. *ibid.*

49. Hart, "Tolkien, Creation, and Creativity", 47.

A strong place and wonderful was Isengard. . . . But Saruman had slowly shaped it to his shifting purposes, and made it better, as he thought, being deceived – for all those arts and subtle devices for which he forsook his former wisdom, and which fondly he imagined were his own, came but from Mordor; so that what he made was naught, only a little copy, a child’s model or a slave’s flattery, of that vast fortress, armoury prison, furnace of great power, Barad-dûr, The Dark Tower, which suffered no rival, and laughed at flattery, biding its time, secure in its pride and its immeasurable strength.⁵⁰

We see here the impulse to dominate present in corrupted co-creative activity; there are echoes of Heidegger in Tolkien’s warning that will be explored later in this chapter.

We can also learn about these limits from Samwise Gamgee, as he resists the temptation to claim the Ring, and all the power it would afford him, for his own.

In that hour of trial it was the love of his master that helped most to hold him firm; but also deep down in him lived still unconquered his plain hobbit-sense: he knew in the core of his heart that he was not large enough to bear such a burden. . . . The one small garden of a free gardener was all his need and due, not a garden swollen to a realm; his own hands to use, not the hands of others to command.⁵¹

His response requires two things: a greater love and a knowledge of his own limitations. He knows who he is, and thus can reject the Ring’s power.⁵² Humility is clearly a virtue that guides proper sub-creation, and Sam recognises the rightful proportions of his creative domain in his modest efforts in the Shire.

In examining these instances of sub-creation used and misused, we can see that the notion of sub-creation immediately asserts some boundaries that are not as evident in other co-creation theologies. The sub-creator cannot create *ex nihilo*, rather “each shall choose forever from the all.”⁵³ Sub-creation is a mimetic art that can only reshape or reform existing material. Even in sub-creation, Tolkien believed it was necessary to preserve certain fundamentals, such as divine sovereignty and the goodness of creation.⁵⁴ For all must be under the will of God, “in every world on

50. *TT*, 160–161.

51. *RK*, 177.

52. Eric Katz, “The Rings of Tolkien and Plato: Lessons in Power, Choice, and Morality,” in *The Lord of the Rings and Philosophy: One Book to Rule Them All*, ed. Gregory Bassham and Eric Bronson (Open Court, 2003), 18.

53. “Mythopoeia”, 90.

54. Hart, “Tolkien, Creation, and Creativity”, 43.

every plane”.⁵⁵ In the *Ainulindulë*, Hart contends that “*our* creaturely creativity” is set in “proper theological perspective”.⁵⁶ After redirecting and overcoming Melkor’s discordant efforts, Ilúvatar reiterates that “no theme may be played that hath not its uttermost source in me”.⁵⁷

5.3 Tolkien's Sources

Like Hefner’s understanding of co-creation, Tolkien’s work draws on a number of traditions. Whereas Hefner writes as a theologian, however, Tolkien very emphatically does not. Drawing out the theological commitments that underpin his ideas is therefore more fraught an undertaking than the similar exercise for Hefner in previous chapters. Some of the literary and philological sources that influenced Tolkien are explored, given this was both his profession and his passion, as are several philosophical currents that may have shaped Tolkien, and the impact of certain personal experiences. In discussing some of the influences on Tolkien’s work, we keep in mind his quoting of George Webb Dasent: “We must be satisfied with the soup that is set before us, and not desire to see the bones of the ox out of which it has been boiled.”⁵⁸ Tolkien’s fiction is far greater than the sum of its sources, and the following is set forth for understanding rather than explaining or mastering his achievements.

5.3.1 Theological

As the current project is concerned with theological notions of human creativity, we might begin with the theological influences that have shaped Tolkien’s thought. We must in our analysis of Tolkien heed Flieger’s reminder that Tolkien was writing fiction, and not theology.⁵⁹ While Tolkien was primarily a philologist and a scholar of literature, his views on language, truth and writing were firmly rooted in his Roman Catholic faith. He considered theological writing to be within the

55. *Letters*, 191.

56. Hart, “Tolkien, Creation, and Creativity”, 44, emphasis original.

57. *Silmarillion*, 17.

58. As cited in *OFS*, 20.

59. Verlyn Flieger, *Green Suns and Faerie: Essays on J. R. R. Tolkien* (Kent State University Press, 2012), 17.

appropriate domain of professional theologians only, and was distressed at his friend Lewis' forays into this arena.⁶⁰ At one stage, Tolkien himself affirmed the religious character of his writings:

The Lord of the Rings is of course a fundamentally religious and Catholic work, unconsciously so at first, but consciously in the revision. That is why I have not put in, or have cut out, practically all references to anything like 'religion', to cults or practices, in the imaginary world.⁶¹

Yet Tolkien is ambiguous elsewhere on this matter. While he appeared to be happy with those who read Christian interpretations out of his fantasy writings, he wrote to publisher Milton Waldman that he did not intend his Secondary World of Middle-earth and its associated cosmology to have explicit religious content, including that of Christianity.⁶² He elsewhere attributes the religious nature of his work more to unconscious influences, expressing his gratitude for having been raised in a nourishing faith from an early age.⁶³ Ronald Hutton offers a possible explanation – Tolkien's acknowledgement of the religious or Catholic nature of the works were in defence against reviewer criticisms of the pagan elements of the text, designed to reassert Tolkien's status as a believer, rather than a true representation of Tolkien's treatment of religion in the works.⁶⁴ Flieger offers another – he simply presented his work differently depending on his correspondent. Writing to his publisher he sought acceptance for his work on its own merits, eschewing any categorisation as Christian allegory; to fellow Catholics he was willing to accept more explicitly Christian readings.⁶⁵ Paul Kerry offers a recent and comprehensive survey of scholarship that explores and debates the degree of Christian influence and resonances in Tolkien's mythology, a subject that remains disputed.⁶⁶

60. *Letters*, 352.

61. *Letters*, 172.

62. *Letters*, 144.

63. *Letters*, 172.

64. Ronald Hutton, "The Pagan Tolkien," in *The Ring and the Cross: Christianity and the Writings of J. R. R. Tolkien*, ed. Paul Kerry (Fairleigh Dickinson University Press, 2011), 58–59.

65. Verlyn Flieger, "But What Did He Really Mean?," in *There Would Always Be a Fairy Tale: More Essays on Tolkien* (Kent State University Press, 2017), 18–19.

66. Paul Kerry, ed., *The Ring and the Cross: Christianity and the Writings of J. R. R. Tolkien* (Fairleigh Dickinson University Press, 2011), introduction.

Shippey derides attempts to read more religious significance into *LOTR* than is either present, or intended, by Tolkien. While there are strong tones of providence, and a sense of “other-worldliness” throughout, the thought-world of Christianity is generally absent from the work.⁶⁷ Given Tolkien’s own disavowal of any explicit “theologising”, it is surprising how many persist in trying to tease out his theological views from his created mythology. Nicholas Boyle, to give one example, perhaps overstates the case in his assertion that “the success of Frodo’s mission is a salvation which only a Catholic outlook can explain”.⁶⁸

At best, we might discuss parallels between traditional Christian doctrine and themes in Tolkien’s created world. There may be insights into how Tolkien conceived of divine and human creativity within his own Christian faith, though not direct correspondence. Recognising that Tolkien was consciously not attempting an allegorical account of Christianity, Hart highlights a number of theological themes evident in Tolkien’s myth that are preserved from Christian mythology. The One, Ilúvatar, remains sovereign throughout, and a dualistic view of good struggling with evil is clearly ruled out (despite the literary advantages of such circumstances).⁶⁹ The ultimate victory of good over evil is evident from the outset. Hart also points out that the manifestation of creaturely good and evil is connected with creativity according to Tolkien. Both Melkor and the rest of the Ainur exercise freedom in their creativity – the “responsible and respectful” creativity of the Ainur defers to Ilúvatar’s design and thus fulfils creaturely vocation, whereas Melkor seeks “a form of creativity like unto Ilúvatar’s own”.⁷⁰ Finally, Hart draws attention to the way in which Ilúvatar deals with Melkor’s discordant melodies – rather than overwhelming

67. Tom Shippey, “Creation from Philology,” in *J. R. R. Tolkien, Scholar and Storyteller: Essays in Memoriam*, ed. Mary Salu and Robert Farrell (Cornell University Press, 1979), 309.

68. Nicholas Boyle, *Sacred and Secular Scriptures: A Catholic Approach to Literature* (University of Notre Dame Press, 2005), 256. For example, Boyle does not consider the failures of Frodo, or lack of a happy ending, treated in a far more nuanced way by Verlyn Flieger, “Eucatastrophe and the Dark,” in *There Would Always Be a Fairy Tale: More Essays on Tolkien* (Kent State University Press, 2017).

69. Hart, “Tolkien, Creation, and Creativity”, 45.

70. *ibid.*, 46–47.

them with his own more powerful music, he employs his superior artistry to adjust the whole, in order to render disharmony as ultimately harmonious.⁷¹

Ralph Wood delves further into Tolkien's mythical representation of creation. Like Hart, he rejects a dualistic interpretation of Tolkien's work.⁷² Instead, argues Wood, Tolkien follows Augustine in the understanding of evil as *privatio boni*, the absence or perversion of the good.⁷³ Thus, the various creatures in *LOTR* are cast in these relationships: "trolls are parodies of ents, the uruk-hai are mockeries of men, and the orcs are apes of elves".⁷⁴ These creatures are the evil sub-creative products of Melkor and Sauron – they do not have true life but are rather "dreadful twistings and distortions of the good creation".⁷⁵ Evil, therefore, does not have ontological status.

Flieger highlights equally important differences between Tolkien's imaginative vision and a traditional Christian view, which ought not be overlooked (nor used to charge Tolkien with any kind of heterodoxy).

In Tolkien's work, the fall is Melkor's, not Adam's. Tolkien's sub-created cosmos has no Paradise from which humanity is driven out, only a world flawed in the making into which they are introduced in order to change it. Elves and Men will carry the responsibility for illustrating... just how living in an imperfect world might serve a larger plan.⁷⁶

Tolkien himself acknowledges this difference in one of his letters, highlighting the rebellion of "created free-will" in his mythology as an event that preceded the creation of the world and contrasting this with his own understanding of Christian theology.⁷⁷ Tolkien's world is much darker than a Christian worldview would construe our world; the equivalent of original sin entered the former at the time

71. *ibid.*, 47.

72. Ralph Wood, "Tolkien's Augustinian Understanding of Good and Evil: Why *The Lord of the Rings* Is Not Manichean," in *Tree of Tales: Tolkien, Literature and Theology*, ed. Trevor Hart and Ivan Khovacs (Baylor University Press, 2007), 85. This is contra to the Shippey's claim that Tolkien's representation of good and evil amounts to Manichaeism (Shippey, *J. R. R. Tolkien: Author of the Century*, 134). Given Shippey's own rejection of reading too much religious significance into *LOTR*, however, we must remember that debating over Manichaean elements in Tolkien's fiction has little bearing on understanding his actual doctrinal commitments.

73. Wood, "Tolkien's Augustinian Understanding", 86. Note Tolkien's own rejection of absolute evil as "Zero" (*Letters*, 243).

74. *ibid.*, 86.

75. *ibid.*, 86.

76. Flieger, "The Music and The Task", 37.

77. *Letters*, 286-287.

of its formation.⁷⁸ Furthermore, there is no Christ in Tolkien's narrative – though characters such as Frodo, Gandalf and Aragorn are often identified with the Christ figure, “there is no one character who buys back for all time what has been lost”.⁷⁹ While the discussions over the theological themes in Middle-earth are numerous, inexhaustible perhaps, these examples will suffice here. However interesting in their own right, these fictional religious elements do not provide a firm enough foundation on which to ascribe certain convictions to their author.

Acknowledging that Tolkien's fictional writings do not provide straightforward insights into his own theological commitments, it is instead worth considering the particular nature of Tolkien's religious context, out of which his understanding of creativity developed. We can understand Tolkien's worldview to be formed by the Roman Catholic orthodoxy of his teachers and priests in Birmingham and in Oxford, and this backdrop illuminates aspects of his writing, but again speculation over particular emphases and doctrinal positions within this tradition will only take us so far.

Yannick Imbert, in a detailed consideration of Roman Catholicism in Tolkien's lifetime, argues that to be a Catholic in Oxford when Tolkien was meant “living under the shadow of [John Henry] Newman”.⁸⁰ As a mediaeval scholar, and a traditionalist who received his education after the First Vatican Council's revival of Thomism, scholars have unsurprisingly identified affinities between Tolkien and Aquinas across a range of doctrinal loci (especially creation and freedom).⁸¹ Helms considers the effect of Roman Catholicism on Tolkien's work by contrasting his approach to art and fiction with that of C. S. Lewis. For Tolkien, Scripture was not the only window to the sacred; non-Biblical mythology and religious writing could perform similar functions while remaining “mere” literature.⁸² Tolkien was

78. Verlyn Flieger, “A Cautionary Tale: Tolkien's Mythology for England,” in *Green Suns and Faerie: Essays on J. R. R. Tolkien* (Kent State University Press, 2012), 239.

79. Flieger, *Green Suns and Faerie*, 223.

80. Yannick Imbert, “‘Who Invented the Stories Anyway?’ A Reformed Perspective on Tolkien's Theory of Fantasy” (PhD diss., Westminster Theological Seminary, 2010), 36.

81. Alison Milbank, *Chesterton and Tolkien as Theologians: The Fantasy of the Real* (T & T Clark, 2007); Jonathan McIntosh, *The Flame Imperishable: Tolkien, St. Thomas, and the Metaphysics of Faërie* (Angelico Press, 2017).

82. Helms, “All Tales Need Not Come True”, 31.

thus able to value the aesthetic and inspirational value of fantasy literature in its own right, without requiring strong Christian allegory.⁸³ Indeed, Tolkien's Catholic faith led him to a sacramental view of nature; Mircea Eliade describes nature as "always fraught with a religious value" from this perspective.⁸⁴ The world is "impregnated with sacredness",⁸⁵ and places within it are consecrated as a paradigm of creation.⁸⁶ William Dowie identifies natural histerophany as a major aspect of Tolkien's view of the transcendent, seen in the natural symbolism of *LOTR*.⁸⁷ Similarly, the Catholic natural law tradition likely shaped Tolkien's views toward pagan sources, and their contributions to culture.⁸⁸

Debbie Sly goes as far as to link the origins of evil, for Tolkien, with the sub-creative impulse.⁸⁹ Stories and art exist because of the Fall; discordant themes increase the aesthetic and affective power of art.⁹⁰ While this can only be speculation,⁹¹ we can certainly attribute to Tolkien a strong notion of humanity's fallenness. Referring to the fall in the cosmogony of the *Silmarillion*, Tolkien writes that "there cannot be any 'story' without a fall – all stories are ultimately about the fall – at least not for human minds as we know them and have them".⁹² This understanding of fallenness is matched by Tolkien's assurance of redemption. As well as a fall, stories contain "glimpses of final victory".⁹³ Moulin contends that

83. *ibid.*, 32.

84. Mircea Eliade, *The Sacred and the Profane: The Nature of Religion* (Houghton Mifflin Harcourt, 1959), 179.

85. *ibid.*, 179.

86. William Dowie, "The Gospel of Middle-Earth," in *J. R. R. Tolkien, Scholar and Storyteller: Essays in Memoriam*, ed. Mary Salu and Robert Farrell (Cornell University Press, 1979), 269.

87. *ibid.*, 274.

88. Peter Kreeft, *The Philosophy of Tolkien: The Worldview behind 'The Lord of the Rings'* (Ignatius, 2005), 222.

89. Debbie Sly, "Weaving Nets of Gloom: 'Darkness Profound' in Tolkien and Milton," in *J. R. R. Tolkien and His Literary Resonances*, ed. George Clark and Daniel Timmons (Greenwood Press, 2000), 118.

90. *ibid.*, 118.

91. Given Sly mentions the Fall, she is either (1) not speaking of the Fall in human terms, (2) takes the view that Tolkien hinted toward some Fall of humanity in his fictional mythology (see Tolkien's piece "Athrabeth Finrod ah Andreth"), or (3) is speculating about Tolkien's personal theological views.

92. *Letters*, 147.

93. *Letters*, 255.

Tolkien's ideas of recovery "may be viewed as a quest for atonement with the Creator through mythopoeic literature".⁹⁴

5.3.2 Philological/Literary

While Tolkien rejected any characterisation of himself as a theologian, he certainly identified as a philologist and scholar of literature. A survey of Tolkien's literary influences would warrant a dissertation on its own, a mere selection of the major traditions that come together in his writing are introduced briefly here.⁹⁵ Though an overview of sources is helpful, a detailed dissection is perhaps detrimental to understanding Tolkien. Michael Drout and Hilary Wynne assert the difficulty of untangling analogy from homology in Tolkien's work, and caution against "using mere resemblances (and often faint resemblances) to make claims about putative sources".⁹⁶

Nevertheless, Tolkien's work abounds in literary resonances. However, Tolkien was a philologist first, and it bears remembering that his entire *Legendarium* originated in his efforts to design a new language, Quenya (based somewhat on Finnish).⁹⁷ "The 'stories' were made rather to provide a world for the language than the reverse."⁹⁸ While some have challenged this claim as overblown, and largely ignore it, Shippey makes a comprehensive case for how important linguistics were to Tolkien's inspiration and the meaning he intended in his work.⁹⁹ Williams goes even further, avowing that Tolkien was "the greatest storyteller of

94. Moulin, "J. R. R. Tolkien's 'Eucatastrophe'", 86.

95. For a more comprehensive treatment of Tolkien's literary influences, see Jane Chance, ed., *Tolkien and the Invention of Myth: A Reader* (University of Kentucky Press, 2004).

96. Michael Drout and Hilary Wynne, "Tom Shippey's *J. R. R. Tolkien: Author of the Century* and a Look Back at Tolkien Criticism since 1982," *Envoi* 9, no. 2 (2000), 107. Schlobin argues this particularly with respect to the influence of *Sir Gawain and the Green Knight* on Tolkien's work (Roger Schlobin, "The Monsters Are Talismans and Transgressions: Tolkien and *Sir Gawain and the Green Knight*," in *J. R. R. Tolkien and His Literary Resonances*, ed. George Clark and Daniel Timmons (Greenwood Press, 2000), 71).

97. Tolkien writes as much in a letter to his son Christopher, describing *LOTR* as an attempt to create a realistic world for his created language (*Letters*, 264).

98. Tolkien, as quoted in Edmund Wilson, "Oo, Those Awful Orcs!," in *The Bit between My Teeth* (Farrar, Straus & Giroux, 1966), 328.

99. Shippey, "Creation from Philology".

the twentieth century” precisely because he began creating his secondary world by constructing a language.¹⁰⁰

Norse and Finnish mythologies captured Tolkien’s attention as a student. C. W. Sullivan III traces the contours of old Icelandic saga in Tolkien’s story structure, as well as his complicated heroes that challenge heroic ideals.¹⁰¹ To a certain degree, Tolkien’s interest in dragon lore was mediated by nineteenth-century depictions of such themes (primarily in the work of Andrew Lang and William Morris), however Tolkien immersed himself also in the original mediaeval sources.¹⁰² Shippey argues that Middle-earth is charged with the same atmosphere as the Finnish *Kalevala*, a nineteenth century poetic mythology, “one that accepts ultimate defeat and finds victory only in song, in recreation”.¹⁰³ Along with the *Edda*, the *Kalevala* gave Tolkien a picture of a pre-Christian age, as represented by Christians looking back yet remaining in touch with pagan imagination.¹⁰⁴ Similarly, the Arthurian legends of Middle England held great appeal for Tolkien – he left unfinished a poem entitled “The Fall of Arthur” and Flieger argues that Arthur “was in the back of [Tolkien’s] mind” throughout the construction of the *Legendarium*.¹⁰⁵ David Lyle Jeffrey similarly argues that Tolkien’s notion of sub-creation reflects the perspective of the mediaeval writer.¹⁰⁶

Darielle Richards locates Tolkien’s thought within a history of creativity called the “tradition of the magus”, which has its roots in the work of Renaissance thinker Ficino (discussed in chapter two).¹⁰⁷ Ficino conceives of the “magi” creator as an

100. Williams, *Mere Humanity*, 115.

101. C. W. Sullivan III, “Tolkien the Bard: His Tale Grew in the Telling,” in *J. R. R. Tolkien and His Literary Resonances*, ed. George Clark and Daniel Timmons (Greenwood Press, 2000), 17.

102. Jonathan Evans, “The Dragon-Lore of Middle-Earth: Tolkien and Old English and Old Norse Tradition,” in *J. R. R. Tolkien and His Literary Resonances*, ed. George Clark and Daniel Timmons (Greenwood Press, 2000), 22. This mythological heritage is treated at length in (Marjorie Burns, *Perilous Realms: Celtic and Norse in Tolkien’s Middle-earth* (University of Toronto Press, 2005)).

103. Tom Shippey, “Tolkien and the Appeal of the Pagan: *Edda* and *Kalevala*,” in *Tolkien and the Invention of Myth: A Reader*, ed. Jane Chance (University of Kentucky Press, 2004), 158–159.

104. *ibid.*, 159.

105. Verlyn Flieger, *Interrupted Music: The Making of Tolkien’s Mythology* (Kent State University Press, 2005), 41–42.

106. David Lyle Jeffrey, “Tolkien as Philologist,” in *Tolkien and the Invention of Myth: A Reader*, ed. Jane Chance (University of Kentucky Press, 2004), 65.

107. Darielle Richards, “The Creative Process of J. R. R. Tolkien and the Tradition of the Magus” (PhD diss., Pacifica Graduate Institute, 2005), 7.

artist-priest, inhabiting an imaginative world and emphasising kinship with all of life and nature.¹⁰⁸ Though often called “magic”, Pico argues that the creativity practiced in the magus tradition is “nothing else but the highest realization of natural philosophy”.¹⁰⁹ According to Richards, Tolkien demonstrates a deep affinity with this tradition, “these pathfinders who hold the creative imagination in highest regard”.¹¹⁰ Though Richards perhaps unduly romanticises the “magus tradition”, describing it as a “‘secret’ society of the Heart”,¹¹¹ and there is little indication that Tolkien consciously aligned himself with these Renaissance thinkers, the valuing of creativity and imagination that Tolkien shared with the likes of Ficino suggests a certain kinship. Tanya Wood also suggests a link with the Renaissance, identifying commonalities between Tolkien’s *OFS* and Philip Sidney’s *Defence of Poesy*, and a shared value of the recreative imagination, classical rediscovery, and Christian humanism.¹¹²

A connection between Coleridge and Tolkien has already been identified. Indeed, Tolkien’s writings were heralded as a renewal of Romanticism in literature in an era that favoured realism and empiricism.¹¹³ Lewis was effusive in his review of the first volume of *LOTR* upon its publication in 1954, declaring that “in it heroic romance, gorgeous, eloquent, and unashamed, has suddenly returned at a period almost pathological in its anti-romanticism”.¹¹⁴ David Sandner draws parallels between Tolkien’s notions of faerie and fantasy and the Romantic idea of the sublime.¹¹⁵ William Blissett described *LOTR* as “perhaps the last literary masterpiece of the

108. Richards, “The Creative Process of Tolkien”, 7.

109. Pico della Mirandola, *Oration on the Dignity of Man*, 53.

110. Richards, “The Creative Process of Tolkien”, 15.

111. *ibid.*, 28. Indeed, Richards identifies a mystical tendency in Tolkien, affiliating him as she does with the “magi”, the “great reconciler of opposites” that unites the Romantic and the reductionist from an “engagement from the threshold of the Heart” (*ibid.*, 32).

112. Tanya Wood, “Is Tolkien a Renaissance Man? Sir Philip Sidney’s *Defence of Poesy* and J. R. R. Tolkien’s ‘On Fairy-Stories’,” in *J. R. R. Tolkien and His Literary Resonances*, ed. George Clark and Daniel Timmons (Greenwood Press, 2000), 106.

113. Greene, “‘Higher Argument’”, 45.

114. C. S. Lewis, “The Gods Return to Earth,” in *A Reader’s Companion to the Hobbit and the Lord of the Rings* (Quality Paperback Book Club, 1995), 31.

115. David Sandner, “The Fantastic Sublime: ‘On Fairy-Stories’ and the Romantic Sublime,” *Mythlore* 22, no. 1 (1997), 4.

Middle Ages”,¹¹⁶ again attesting its continuity with much earlier literary traditions.

Though there are strong parallels between Coleridge’s and Tolkien’s understandings of the imagination, Flieger contends that they diverge when it comes to the notion of fancy. Whereas Coleridge conceives of fancy as a “mode of memory” without the power to create, Tolkien connects fancy to the older notion of fantasy and considers it to be more closely related to the imagination in its image-making capacity.¹¹⁷ Of course, both Coleridge’s use of the word “recreate” and Tolkien’s “sub-creation” reserve the act of absolute creation for the Creator alone.¹¹⁸

One major difference between Coleridge and Tolkien is their approach to writing and the drawing in of the reader. Coleridge argues that the reader submits to a “willing suspension of disbelief”.¹¹⁹ Tolkien not only takes exception to Coleridge on this point, viewing the suspension of disbelief as a condescending subterfuge,¹²⁰ but, according to Clyde Northrup, extends the theory of imagination offered by Coleridge to its “logical next step”.¹²¹ Anita Gorman agrees:

The reader enters the secondary world via a process more powerful than Coleridge’s theory of the willing suspension of disbelief. Art leads not to a rather tepid mere suspension of disbelief, but, in Tolkien’s view, to the more positive secondary belief, not a belief that is second-rate, but a credo which parallels that secondary world created by humanity.¹²²

Tolkien was also influenced by fellow Inkling Owen Barfield’s theory of semantic unity, which argued for the interdependency of myth, language and worldview.¹²³

116. William Blissett, “The Despots of the Rings,” *South Atlantic Quarterly* 58 (1959), 449.

117. Flieger, *Splintered Light*, 24. The term “fancy” derived from the Greek *phantasia*, has an interesting history of interpretation that is outside the present scope. Engell suggests that for the Romantics, and Coleridge in particular, it denoted a greater freedom of mind and capacity for creative insight than the Latin *imaginatio*. Perhaps for this reason, “the word “fancy” began to bear the brunt of suspicion or distrust thrown by seventeenth century rationalism” (Engell, *The Creative Imagination*, 173). Tolkien appears to imbue the word “fancy” with at least as much significance as Coleridge.

118. Richard Campbell, “Assisting the Effoliation of Creation: J. R. R. Tolkien’s Sub-Creation Theory and C. S. Lewis’s Imagination” (PhD diss., Union Institute & University, 2010), 86.

119. Coleridge, *Biographia Literaria*, 168.

120. *OFS*, 37.

121. Northrup, “The Qualities of Tolkienian Fantasy”, 12.

122. Anita Gorman, “J. R. R. Tolkien’s ‘Leaf by Niggle’: Word Pairs and Paradoxes,” *Mythlore* 20, no. 4 (1995), 52.

123. Flieger, *Splintered Light*, 38. An exploration of Barfield’s thought is beyond the current scope, however interested readers should begin with his seminal text on the subject – Owen Barfield, *Poetic Diction: A Study of Meaning*, 3rd ed. (Wesleyan University Press, 1973). Tolkien himself

According to Barfield, the distinction between the literal and the metaphorical in contemporary language is a fragmentation that arose with conceptual thinking; “words originally embodied an ancient, unified perception”.¹²⁴ Flieger describes Tolkien’s understanding of language:

Words were for Tolkien not simply a window on the past but the key to that lost relationship between humanity and God of which a sense of the Fall is only memory. Words are the clearest record of that “long defeat” of which he wrote, and we may imagine that he saw them also as the vehicles for the “glimpses of final victory” for which he hoped.¹²⁵

Language, for Tolkien, is what confers the ability to become sub-creators. Through language one can create a fantasy world, words can be used to modify perception.¹²⁶ Furthermore, language itself is what provides epistemic access to the world – names should be related to their referents through “right reasoning” rather than “idle fancy”.¹²⁷

B. S. W. Barootes picks up on a similar theme, arguing that there is a “clear pattern of progressive diminution of the creative and performative powers of language” in Tolkien’s *Legendarium*.¹²⁸ He uses the interpretative model of language history suggested by Northrop Frye (which in turn was developed using the earlier models of Giambattista Vico), to trace a shift away from metaphor in Tolkien’s work, a “progressive displacement from primal unity”.¹²⁹ Barootes sums up the present state of language, acutely represented by Tolkien, as “a painful reminder of

confided to Lewis that his whole outlook had been modified by Barfield’s account of ancient semantic unity (Carpenter, *The Inklings*, 41). Imbert rightly cautions, however, against equating Tolkien and Barfield too closely, given that Barfield’s philosophy cannot be extricated from his Anthroposophic belief, which Tolkien certainly did not share (Imbert, “‘Who Invented the Stories Anyway?’”, 70).

124. Carpenter, *The Inklings*, 42.

125. Flieger, *Splintered Light*, 9.

126. *ibid.*, 40.

127. Mary Zimmer, “Creating and Re-Creating Worlds with Words: The Religion and Magic of Language in *The Lord of the Rings*,” in *Tolkien and the Invention of Myth: A Reader*, ed. Jane Chance (University of Kentucky Press, 2004), 55; c.f. Ross Arthur, *Medieval Sign Theory and “Sir Gawain and the Green Knight”* (University of Toronto Press, 1987), 28; Mark Amsler, *Etymology and Grammatical Discourse in Late Antiquity and the Middle Ages* (John Benjamins, 1988), 12.

128. B. S. W. Barootes, “‘He Chanted a Song of Wizardry’: Words with Power in Middle-Earth,” in *Tolkien in the New Century: Essays in Honour of Tom Shippey*, ed. John Houghton et al. (McFarland & Company, 2014), 116–117.

129. *ibid.*, 117.

the very separation [between words and their referents] that it seeks to overcome”.¹³⁰ Furthermore, Barfield argued that “knowledge without imagination is not knowledge at all, but only a kind of cataloguing”.¹³¹ Poetry, in particular, was for Barfield a means of cognition – he and Tolkien share this Coleridge-inspired view.

5.3.3 Philosophical

Examining Hefner’s dependence on Lakatosian philosophy of science and the possible lingering influence of logical positivism on his work helped illuminate his theological anthropology and epistemological views, as well as providing at least a partial solution for the relative absence of the imagination in his work. Here we consider both the philosophical influences and commitments that feed into Tolkien’s writing, with the hope of achieving similar understanding.

Tolkien, writing several decades earlier than Hefner, worked and theorised contemporaneously with the peak of the modern period in Western thought, and the beginnings of its collapse. We can understand his particular resistance to reductive, atomising views of the world in this light – seen especially in the poem “Mythopoeia”

a star’s a star, some matter in a ball
compelled to courses mathematical
amid the regimented, cold, inane,
where destined atoms are each moment slain.¹³²

Wood finds postmodern resonances in Tolkien’s thought, particularly when it comes to the cultural pluralism demonstrated in Tolkien’s retrieval of Celtic and Northern worldviews.¹³³ This value of linguistic and cultural differences meant that Tolkien had little sympathy for “Enlightenment-inspired attempts to transcend tradition-grounded locality for the sake of allegedly universal values”.¹³⁴ Wood summarises the postmodern affinities of Tolkien’s thought as follows:

130. *ibid.*, 129.

131. Owen Barfield, *Orpheus: A Poetic Drama* (The Steiner Press, 1983), 9.

132. “Mythopoeia”, 87.

133. Ralph Wood, “Tolkien and Postmodernism,” in *Tolkien Among the Moderns*, ed. Ralph Wood (University of Notre Dame Press, 2015), 256–257.

134. *ibid.*, 258.

...there is a postmodernist strain in Tolkien's celebration of cultures and narratives other than his own, his abjuring of abstract ideas and political programs as inherently coercive, and thus his ready confession that we inhabit a world of blessed linguistic particularity and thus of saving cultural limitation. In sum: Tolkien gladly sets the various historical and linguistic worlds in conversation and engagement with each other.¹³⁵

Flieger identifies a similar postmodern strain in the deconstructive nature of *LOTR*, subverting genre by reverting back and forth between mediaeval epic or fairy tale and more contemporary novel form.¹³⁶ Tolkien also shares with postmodernists, according to Wood, a rejection of Enlightenment foundationalism.¹³⁷ Thus, he opposed his colleague Lewis' approach to apologetics, which involved debating nonbelievers in forums such as the Socratic Club.¹³⁸

Tolkien's opposition to modernism is not merely anti-modern, an attempt to counter coercive modern powers with their mediaeval counterpart.¹³⁹ Instead, Tolkien upholds a primeval Northern conception of the heroic that is animated not so much by "preening victory so much as somber defeat".¹⁴⁰ The privileging of pity as a virtue runs counter to both classic and modern thought.¹⁴¹ Here he differs from the postmodernists as well, in that he does not propose postmodern solutions to the problems that he identifies.¹⁴² While he advocates cultural pluralism in the face of a modern tendency to propagate monocultures, Tolkien certainly does not affirm religious pluralism.¹⁴³

Rod Rosenquist takes a different view, arguing that Tolkien's work, rather than being read as timeless, must be repositioned "within a context of shifting modes of thinking: somewhere between a fading Enlightenment project and an

135. Wood, "Tolkien and Postmodernism", 258.

136. Verlyn Flieger, "A Post-Modern Medievalist," in *Green Suns and Faerie: Essays on J. R. R. Tolkien* (Kent State University Press, 2012), 256.

137. Wood, "Tolkien and Postmodernism", 258.

138. Carpenter, *The Inklings*, 216.

139. Wood, "Tolkien and Postmodernism", 263.

140. *ibid.*, 263.

141. *ibid.*, 271.

142. *ibid.*, 267–268.

143. *ibid.*, 269.

emerging poststructural one”.¹⁴⁴ This runs counter to the characterisation of Tolkien as pre-modern by other scholars.¹⁴⁵ Rosenquist justifies a post-Enlightenment interpretation, however, saying that Tolkien (and Lewis) are

clearly working with the burden of the Enlightenment past on their shoulders, fighting an uphill battle to gather support for a position that seeks to *use* rational argument to support their shared goal of *reducing* dependence upon rational truth alone. In other words, the two authors spend much of their time attempting to rationalise their belief in the irrational, borrowing from one mode of thinking to defend another.¹⁴⁶

In seeking the relationship between objective and subjective truths in the mythic, Rosenquist argues that Tolkien is engaging in an early form of post-Enlightenment thinking.¹⁴⁷ Shippey locates the modern character of Tolkien’s work more especially in the way it struggles with traditional views of good and evil.¹⁴⁸ Thus we see the difficulty of categorising Tolkien in philosophical terms, again his work draws on and resonates with a range of traditions.

5.3.4 Personal

Various personal experiences in Tolkien’s life were formative for his works. John Garth’s biography of Tolkien contends that Tolkien’s experiences of the first world war are key for understanding the enchantment of Middle-earth.¹⁴⁹ According to Garth, Tolkien’s *Legendarium* mythologises the evil of materialism and its attendant disenchantment of the world.¹⁵⁰ Tolkien’s experiences in the trenches as a signalling officer deeply impacted his subsequent views of technology. He scoffed at those who would interpret *LOTR* as an allegory of the second world war, however, pointing out that he had begun writing “long before the foreshadow of 1939 had yet become

144. Rod Rosenquist, “Myth, Fact and ‘Literary Belief’: Imagination and Post-Empiricism in C. S. Lewis and J. R. R. Tolkien,” in *Re-Embroidering the Robe: Faith, Myth and Literary Creation since 1850*, ed. Suzanne Bray, Adrienne Gavin, and Peter Merchant (Cambridge Scholars Publishing, 2008), 116.

145. Rosenquist cites both Colin Duriez and Ralph Wood here (*ibid.*, 116n).

146. *ibid.*, 116, emphasis original.

147. *ibid.*, 125.

148. Shippey, “Creation from Philology”, 159.

149. John Garth, *Tolkien and the Great War: The Threshold of Middle-Earth* (HarperCollins, 2003).

150. *ibid.*, 300–301.

a threat of inevitable disaster”.¹⁵¹ The refusal of the company and friends to wield the Ring against Sauron, and their decision to destroy it, resists any equation of the Ring with nuclear weapons.

While we cannot read his work simply as an allegory of the war, Tolkien's strong sense of the fallenness of human nature was likely shaped as much by his experience of war as it was by his theological commitments – Shippey points out that awareness of evil human nature and the ability of power to corrupt reached new heights in the first half of the twentieth century.¹⁵² Those who lived through the industrialised massacres of the period were left with “an unshakeable conviction of something wrong, something irreducibly evil in the nature of humanity, but without any very satisfactory explanation for it”.¹⁵³

Tolkien's travels also shaped his scenery and characters. The character of Gandalf was reportedly inspired by a German painting of *Der Berggeist* by artist J. Madelener, purchased as a postcard while Tolkien was hiking in Switzerland.¹⁵⁴ At the same time, Tolkien described his own image of Gandalf as a wanderer in the style of Odin, one of the deities in the Norse mythology he loved so well.¹⁵⁵ These are merely a few examples of how Tolkien's experiences and inspirations are intermingled and sometimes serendipitous (we remember here the parable of the soup and the ox bones).¹⁵⁶ His devoutness and loyalty to the Roman Catholic tradition, for example, cannot be untangled from his grief at the loss of his mother in his youth. In his view, his mother had made sacrifices and ultimately died for the sake of preserving his and his brother's faith.¹⁵⁷ Carpenter suggests that Tolkien's fondness for rural settings was also intensified by this early bereavement, as he associated these settings with his mother.¹⁵⁸

151. *FR*, 6.

152. Shippey, *J. R. R. Tolkien: Author of the Century*, 117.

153. *ibid.*, 121.

154. Carpenter, *J. R. R. Tolkien*, 51.

155. *Letters*, 119.

156. See *OFS*, 20.

157. *Letters*, 340.

158. Carpenter, *J. R. R. Tolkien*, 32–33.

Finally, it would be remiss to discuss the influences shaping Tolkien's thought without considering the role of friendship. While this research is not intended to be another treatise on the Inklings, Tolkien's habit of forming clubs and sharing work with like-minded men was of enormous import for the writings he ultimately produced. Andrew Lazo goes as far as to say that the work of C. S. Lewis ought to be the first resource consulted apart from Tolkien's own work in Tolkien scholarship.¹⁵⁹ The influence of Barfield has already been traversed, though Barfield was only an occasional attendee of Inklings gatherings due to his residing in London. The encouragement of colleagues who shared his views on imagination and myth surely contributed to the sub-creation proposal explored in the present work.

5.4 Sub-creation and Reality

Before we turn to the challenge of how sub-creation might inform contemporary reflection on human enhancement, Tolkien's championing of the imagination in the way we construct and are compelled by particular visions of human existence bears closer examining. Tolkien's resistance to the classification of his works as allegory has been discussed already. Roger Lancelyn Green, reviewing Tolkien's *Smith of Wootton Major*, eloquently appeals against allegorising the work, saying "To seek for the meaning is to cut open the ball in search of its bounce",¹⁶⁰ a sentiment that holds across Tolkien's corpus.

Hopefully without destroying the bounce, we now turn to the real-world implications of sub-creation. It is clear through reading Tolkien that his theory of sub-creation was primarily developed with respect to the creation of *imaginary* worlds in literature. But is sub-creation restricted to the realm of fiction? Robley Evans contends the opposite:

Tolkien tells us [in *OFS*] that the vital creative act is that of the imagination which perceives ultimate truth. Its vehicle is Secondary Creation, the fantastic

159. Andrew Lazo, "Gathered Round Northern Fires: The Imaginative Impact of the Kolbitar," in *Tolkien and the Invention of Myth: A Reader*, ed. Jane Chance (University of Kentucky Press, 2004), 215.

160. As cited in *Letters*, 388.

breaking through the limitations of preconceived response, and revealing an essentially sacred reality.¹⁶¹

Tolkien argues that “fairy-story has its own mode of reflecting ‘truth’”, a mode more powerful than simple allegory or realism.¹⁶² “Myth and fairy-story must, as all art, reflect and contain in solution elements of moral and religious truth (or error) but not explicit, not in the known form of the primary “real” world”.¹⁶³ In the prologue to the second edition of *The Silmarillion*, he writes that certain aspects of truth can *only* be received through the mediums of legend and myth.¹⁶⁴ Tolkien claims a moral objective too, pursuing “the elucidation of truth, and the encouragement of good morals in this real world, by the ancient device of exemplifying them in unfamiliar embodiments, that may tend to ‘bring them home’”.¹⁶⁵

Fiction is able to bypass the “dissecting intellect” to reach imagination and intuition.¹⁶⁶ Duriez sees fiction as a medium for communicating religious ideas that would appeal more directly to the imagination.

Tolkien was the master of the allusive story, relying on his deep faith in a natural theology of the imagination, in which the insights incarnate in the tale would be a vehicle of God’s grace to the reader.¹⁶⁷

Kevin Pask traces how the “fairy way of writing” (i.e. fantasy) became the natural forum for expressing religious belief by Tolkien’s time, highlighting predecessor George MacDonald’s work as a prime example.¹⁶⁸ Nagy suggests that for Tolkien myth itself can be salvific – employed appropriately, myth is a device that expresses truth in continuity with tradition.¹⁶⁹ Jeffrey applauds Tolkien’s work as a refutation to critical claims that grand narratives no longer exist.¹⁷⁰ Rather, literature offers

161. Robley Evans, “Tolkien’s World-Creation: Degenerative Recurrence,” *Mythlore* 14, no. 1 (1987), 5.

162. *Letters*, 233.

163. *Letters*, 144.

164. J. R. R. Tolkien, *The Silmarillion*, 1st ed., ed. Christopher Tolkien (HarperCollins, 1999), xv.

165. *Letters*, 194.

166. Flieger, *Splintered Light*, 10.

167. Colin Duriez, “The Fairy Story: J. R. R. Tolkien and C. S. Lewis,” in *Tree of Tales: Tolkien, Literature and Theology*, ed. Trevor Hart and Ivan Khovacs (Baylor University Press, 2007), 16.

168. Kevin Pask, *The Fairy Way of Writing: Shakespeare to Tolkien* (Johns Hopkins University Press, 2013), 123.

169. Nagy, “Saving the Myths”, 95–96.

170. David Lyle Jeffrey, “Tolkien and the Future of Literary Studies,” in *Tree of Tales: Tolkien, Literature and Theology*, ed. Trevor Hart and Ivan Khovacs (Baylor University Press, 2007), 65.

“shareable truth”, which in turn sustains its social authority.¹⁷¹ While Jeffrey would accord the ability to fully nourish the moral character to the “Greater Book” alone (his approbation of Tolkien stems from the fact that he drew on the “common treasure” of the Scriptures), he asserts “the power of literature to enable our will to truth”.¹⁷²

Ursula Le Guin defends the ability of fantasy fiction to convey truths about the human condition, suggesting that “realism is perhaps the least adequate means of understanding or portraying the incredible realities of our existence”.¹⁷³ Iris Murdoch, speaking of artistic production more generally, argues that it “pierces the veil and gives sense to the notion of reality which lies beyond appearance”.¹⁷⁴ Gaiman describes the motivation for his move away from journalism to writing fiction as the desire “to be able to tell the truth without ever needing to worry about the facts”.¹⁷⁵ In fact, Gaiman writes specifically with respect to Tolkien (along with Lewis and Chesterton), that he learned from fiction “that the best way to show people true things is from a direction that they had not imagined the truth coming”.¹⁷⁶ David Sloan Wilson considers scientific and literary wisdom to be mutually reinforcing, rather than in competition, contending that “the human mind, individually and collectively in the form of culture, is impressively adapted to derive conviction without [scientific] proof”.¹⁷⁷

Flieger gives reasons for why the fantasy genre is best suited for conveying certain truths – it is the natural vehicle of a mythic mode of thought that no longer prevails, it allows a “re-creation of that original participation of man with his world which Barfield postulated”.¹⁷⁸ Le Guin uses the same language in speaking

171. *ibid.*, 68.

172. *ibid.*, 70.

173. Ursula Le Guin, “National Book Award Acceptance Speech,” in *Riverside Anthology of Children’s Literature*, 6th ed., ed. Judith Saltman (Houghton Mifflin, 1985), 58.

174. Iris Murdoch, *The Sovereignty of Good* (Routledge, 1970), 86.

175. Neil Gaiman, *The View From the Cheap Seats: Selected Non-Fiction* (Headline Publishing, 2016), 1.

176. Neil Gaiman, “Three Authors: On Lewis, Tolkien and Chesterton,” in *The View From the Cheap Seats: Selected Non-Fiction* (Headline Publishing, 2016), 38.

177. In introduction to Jonathan Gottschall and David Sloan Wilson, eds., *The Literary Animal: Evolution and the Nature of Narrative* (Northwestern University Press, 2005), xxii.

178. Flieger, “Barfield’s ‘Poetic Diction’ and Splintered Light”, 55.

of imagination and play in the context of science fiction and fantasy writing, defining play as “recreation, re-creation, the recombination of what is known into what is new”.¹⁷⁹ Furthermore,

“...distancing, the pulling back from “reality” in order to see it better, is perhaps the essential gesture of SF. It is by distancing that SF achieves aesthetic joy, tragic tension, and moral cogency.”¹⁸⁰

Flieger argues that even the fantastic elements of Tolkien’s work are strongly reminiscent of reality, of the Primary World, to use Tolkien’s vocabulary. Considering *LOTR*, she suggests elves and hobbits are familiar in their humanity, that orcs behave like soldiers in every culture, and that even the Ring, which seems the most fantastic at first glance, is not so fantastic as it might appear. Rather, the Ring is “a direct reference to the Primary World, a sign pointing to and standing for an inescapable, underlying reality or truth, a hard recognition of the human condition”.¹⁸¹ It represents the way that people in reality are subject to power, swayed by greed or envy, vulnerable to injury.¹⁸²

In its capacity to illuminate the Primary World, fantasy is a medium of revelation.¹⁸³ Even within *LOTR*, the ability of story to impart truth and increase understanding is attested, as the hobbits learn more of their world and their place within it through the stories told by Tom Bombadil, and at Rivendell.¹⁸⁴ Lore-masters are highly honoured, preserving knowledge important for the Quest.¹⁸⁵ Kirstin Johnson alerts us to the way in which brothers Boromir and Faramir are contrasted in Tolkien’s epic: Boromir “care[d] little for lore, save the tales of old battles” while Faramir was “otherwise in mind ... a lover of lore and

179. Ursula Le Guin, “Why Are Americans Afraid of Dragons?,” in *The Language of the Night: Essays on Fantasy and Science Fiction*, ed. Susan Wood (Putnam, 1979), 41.

180. Ursula Le Guin, “On Norman Spinrad’s “The Iron Dream,”” *Science Fiction Studies* 1, no. 1 (1973), 43–44.

181. Flieger, *Green Suns and Faerie*, 13.

182. *ibid.*, 12.

183. Kirstin Johnson, “Tolkien’s Mythopoesis,” in *Tree of Tales: Tolkien, Literature and Theology*, ed. Trevor Hart and Ivan Khovacs (Baylor University Press, 2007), 33.

184. *ibid.*, 34.

185. Johnson gives the example of an “old wives’ tale” told to Gandalf in Gondor teaching him of the healing properties of the *kingsfoil* herb, enabling him to save the lives of Faramir, Eowyn and Merry (*ibid.*, 35).

of music”.¹⁸⁶ This is connected to their respective wisdom and ability to resist the Ring’s corrupting pull.

Sandner gives a helpful account of how fantasy and its emphasis on *Faërie* connect with reality in Tolkien’s thought:

The promise of *Faërie* for Tolkien is a return to the world from which we have become estranged. Fantasy expresses a yearning for the world itself, in all its lost (or missing or exiled) fullness.¹⁸⁷

Making a similar point concerning how story relates to truth, Alexander Lucie-Smith writes that

The world of the author (Latin *auctor*, maker) be it ever so fantastical, always bears some relation to our own world, from which the raw materials of authorship and fiction are taken. Noone ever creates from nothing.¹⁸⁸

Despite the value he places on the imagination, Tolkien does not fall into the Romantic tendency to denigrate reason. He suggested that “the keener and the clearer is the reason, the better fantasy will it make,”¹⁸⁹ and that fantasy “does not destroy or even insult Reason”, but instead enhances scientific verity.¹⁹⁰ He represents this in his mythology in his description of the Light of Valinor (from which the sources of light in Middle-earth – the Silmarils, the phial of Galadrial, the sun, moon, and stars – originate) as

The light of art undivorced from reason, that sees things both scientifically (or philosophically) and imaginatively (or subcreatively) and says that they are good...¹⁹¹

Yet there is a sense of knowing, according to Tolkien, that bypasses reason. He describes the experience of “eucatastrophe” as a certainty of knowing something, yet

186. *ibid.*, 35; *RK*, Appendix A, 337.

187. David Sandner, “‘Joy Beyond the Walls of the World’: The Secondary World-Making of J. R. R. Tolkien and C. S. Lewis,” in *J. R. R. Tolkien and His Literary Resonances*, ed. George Clark and Daniel Timmons (Greenwood Press, 2000), 137.

188. Alexander Lucie-Smith, *Narrative Theology and Moral Theology: The Infinite Horizon* (Ashgate, 2007), 11.

189. *OFS*, 55.

190. *ibid.*

191. *Letters*, 148n.

... I could not reproduce any argument that had led to this, though the sensation was the same as having been convinced by *reason* (if without reasoning). And I have since thought that one of the reasons why one can't recapture the wonderful argument or secret when one wakes up is simply because there was not one: but there was (often maybe) a direct appreciation by the mind (sc. Reason) but without the chain of argument we know in our time-serial life.¹⁹²

Richards suggests that at times Tolkien's use of the imagination strongly resembled the *lectio divina* method of mediaeval monasticism.¹⁹³ The imaginative reaching toward truth is not always activity, rather Tolkien articulated a sense of receptivity; waiting patiently on the insights of the imagination in the writing process.

I daresay something had been going on in the 'unconscious' for some time, and that accounts for my feeling throughout, especially when stuck, that I was not inventing but reporting (imperfectly) and had at times to wait till 'what really happened' came through.¹⁹⁴

This experience of Tolkien's illustrates the importance of discipline in the exercise of the imagination – in various ways he had schooled his mind to wait, to reflect. He speaks of the "leaf-mould of the mind", from which stories grow "out of all that has been seen or thought or read".¹⁹⁵

C.S. Lewis offers additional commentary on how imagination and reality relate, sentiments that Tolkien likely would have agreed with. Lewis distinguishes between different types of truth in an essay "Myth Became Fact".

This is our dilemma – either to taste and not to know or to know and not to taste – or, more strictly, to lack one kind of knowledge because we are in an experience or to lack another kind because we are outside it.¹⁹⁶

It is only through myth that propositional truth and experiential reality can be connected, according to Lewis.¹⁹⁷ Rosenquist summarises how this works: "Myth enacts truth in a way that can be experienced, thus allowing one to taste and

192. *Letters*, 101.

193. Richards, "The Creative Process of Tolkien", 23.

194. *Letters*, 211.

195. As quoted in Carpenter, *J. R. R. Tolkien*, 237–238.

196. C. S. Lewis, "Myth Became Fact," in *Essay Collection and Other Short Pieces*, ed. Lesley Walmsley (HarperCollins, 2000), 140.

197. *ibid.*, 141.

know at the same moment.”¹⁹⁸ Lambert Zuidervaart offers the helpful category of “nonpropositionalist”, which both accepts and relativises propositional truth, seeing propositions as neither the sole nor primary bearers of truth and affirming the value of “artistic truth”.¹⁹⁹

Tolkien himself was cautious when it came to claiming truth for his Secondary Worlds. Writers hope to be drawing on reality.²⁰⁰ He describes the “joy” of successful fantasy as “a sudden glimpse of the underlying reality or truth”.²⁰¹ Yet in the *eucatastrophe* of the fantasy tale, Tolkien hesitantly claims more – that we may see a “far-off gleam or echo of *evangelium* in the real world”.²⁰² The gospel stories for Tolkien are the ultimate instance of sub-creation, crossing over into the primary world “the desire and aspiration of sub-creation has been raised to the fulfilment of Creation”.²⁰³ It is because of this “Great Eucatastrophe” that Christians hope in the redemption of their own sub-creation, and the possibility that they “may actually assist in the effoliation and multiple enrichment of creation”.²⁰⁴ Tolkien believed this for his own work, claiming that in his writing he “had the sense of recording what was already ‘there’ . . . not of ‘inventing’”.²⁰⁵

Nils Ivar Agøy explores Tolkien’s hope that the fruits of human creativity would finally be redeemed in the new creation.²⁰⁶ We see this hope expressed most fully perhaps in *Leaf by Niggle*. Niggle’s painting, dismissed by many in the tale as amateur daubing, a distraction from Niggle’s duties, appears in the next world in full splendour, dazzlingly real. The story is particularly meaningful when we understand that Tolkien wrote it while having difficulties with the writing of *LOTR* – we can read the character of Niggle as conveying Tolkien’s own worries over never completing his art, and the constant need to perfect each piece rather

198. Rosenquist, “Myth, Fact and ‘Literary Belief’”, 117.

199. Lambert Zuidervaart, *Artistic Truth: Aesthetics, Discourse, and Imaginative Disclosure* (Cambridge University Press, 2004), 203; c.f. Smith, *Imagining the Kingdom*, 134.

200. *OFS*, 71.

201. *ibid.*

202. *ibid.*

203. *OFS*, 72.

204. *OFS*, 73.

205. *Letters*, 145.

206. Nils Ivar Agøy, “*Quid Hiniildus cum Christo?* New Perspectives on Tolkien’s Theological Dilemma and his Sub-Creation Theory,” *Mythlore* 21 (1996), 34.

than move on, and the plot as revealing Tolkien's hopes that his creativity is connected to the real world in some way.

Certainly this hope was based on Tolkien's Christian conviction, his belief that stories are hallowed by the "Evangelium".²⁰⁷ Williams identifies in Tolkien's work "a wholeness of vision that increasingly eludes us", drawing on a humanity that remained unfragmented by reductionist philosophies.²⁰⁸ This wholeness is made possible because "body and spirit, history and myth, imagination and reason all found their unity, as indeed all reality does, in the creative and incarnated Logos which is also the ultimate paradigm of humanity".²⁰⁹

5.4.1 Narrative

Transhumanist Anders Sandberg argues that the scholarly debate over enhancement issues has largely ignored questions concerning flourishing and the meaning of life, "perhaps because of the reluctance of postmodern academia to engage with 'great stories' that provide an overarching explanation of life or give universal moral principles".²¹⁰ This leads us quite naturally into a crucial resource for both reflecting on and shaping visions of a good life (which is obviously integral to the kinds of enhancements desired). Our ability to reason about things, including technology, is determined by the framing we give a particular situation, by the metaphorical concepts that we use to categorise it.²¹¹ And metaphor, in turn, is associated with and partially incorporated into another category that is central to the moral imagination: narrative.

Charles Taylor connects the communal aspect of defining human flourishing with narrative, which he sees as an "inescapable" part of decision-making regarding the good life.²¹² James K. A. Smith similarly locates the power of communicating

207. *OFS*, 73.

208. Williams, *Mere Humanity*, 133–134.

209. *ibid.*, 134.

210. Sandberg, "Transhumanism and the Meaning of Life", 8.

211. Mark Johnson, *Moral Imagination: Implications of Cognitive Science for Ethics* (University of Chicago Press, 1993), 2.

212. Charles Taylor, *Sources of the Self: The Making of the Modern Identity* (Harvard University Press, 1989), 51. In part of the overall narrative of secularisation, Taylor argues that even theistic notions of human flourishing have shifted into the immanent frame, reconfiguring providence as

visions of the good life in story and myth: “Because we are affective before we are cognitive. . . , visions of the good get inscribed in us by means that are commensurate with our primarily affective, imaginative nature.”²¹³ Furthermore

A particular vision of the good life becomes embedded in our dispositions or “adaptive unconscious” by being *pictured* in concrete, alluring ways that attract us at a noncognitive level. . . . Such pictures appeal to our adaptive unconscious because they traffic in the stuff of embodiment and affectivity. Stories seep into us – and stay there and haunt us – more than a report on the facts.²¹⁴

Liturgies, according to Smith, inculcate in us particular visions of the good life precisely because they are *story*-laden practices, which over time “conscript us into the story they ‘tell’ by showing”.²¹⁵

As compressed narratives and tactile poems, the formative power of liturgies (whether secular or sacred) is bound up with their aesthetic force. Such liturgies are pedagogies of desire that shape our love because they *picture* the good life for us in ways that resonate with our imaginative nature. Over time, we are formed as a people who desire a certain *telos* because we have been immersed in liturgies that have captured our imagination by aesthetic means.²¹⁶

Symbol and metaphor, as Alexander Lucie-Smith points out, are the “stuff of story” – though human constructs, “they represent our deepest appropriation of reality.”²¹⁷ Tolkien recognised the centrality of narrative to human existence, arguing that “to ask what is the origin of stories, is to ask what is the origin of the mind, and of language”.²¹⁸ Understanding theology in narrative terms does not diminish God in any way, but rather “may represent our most profound understanding of God” and divine revelation.²¹⁹ It is thus “a mistake to assume too stark a polarity between the particularity of narrative and the universal import of abstract rationality”.²²⁰

an ordering of the present world for the accomplishment of God’s goals for us (Charles Taylor, *A Secular Age* (Harvard University Press, 2007), 177, 221). Smith challenges Taylor’s argument here, suggesting he is positing a false dichotomy between nature and grace, whereas Smith would argue for a greater continuity between creation and redemption (James K. A. Smith, *How (Not) to Be Secular: Reading Charles Taylor* (Eerdmans Publishing Co., 2014), 48n).

213. Smith, *Desiring the Kingdom*, 53.

214. *ibid.*, 58.

215. Smith, *Imagining the Kingdom*, 109.

216. *ibid.*, 137, emphasis original.

217. Lucie-Smith, *Narrative Theology*, 2.

218. *OFS*, 17.

219. Lucie-Smith, *Narrative Theology*, 2.

220. *ibid.*, 11.

Like metaphor, narrative has enjoyed recent attention in the evolutionary and cognitive sciences. A prototypical story maps well onto one of the most fundamental metaphors with which we conceive of human action: the “source-path-goal” schema or “journey” understanding.²²¹ David Sloan Wilson hypothesises that human adaptation to particular environments is partly accomplished through narrative construction.²²² Hefner also attests to the evolutionary significance of myth and story, citing a range of scientific resources that support the biological underpinnings of our capacity to construct contextualising narratives.

Hauerwas and Jones raised pertinent questions concerning the growing academic interest in narrative nearly thirty years ago. Though they recognise the significant contributions a narrative approach can bring to theology and ethics, they caution against an overly general appeal to “narrative” that renders the notion unhelpful, as well as the tendency to apply it uncritically as part of a passing fad.²²³ Appeals to narratives are not simply because we find “stories” to be significant in some way, rather rationality, argumentation and historical understanding are fundamentally narrative in form.²²⁴ Lucie-Smith also highlights the importance of not collapsing narrative theology into literary theory, though it may benefit from the critical tools of literary studies.²²⁵

Lucie-Smith postulates that common precultural elements might exist in all stories – a shared structure that might point us toward some kind of universal truth.²²⁶ It is surprising, given this line of thought, that he does not engage Lakoff and Johnson’s work on metaphor. Augustine is his major interlocutor in his attempt to identify a model of narrative that is able to transcend its origins,

221. Johnson, *Moral Imagination*, 168.

222. David Sloan Wilson, “Evolutionary Social Constructivism,” in *The Literary Animal: Evolution and the Nature of Narrative*, ed. Jonathan Gottschall and David Sloan Wilson (Northwestern University Press, 2005), 21.

223. Stanley Hauerwas and L. Gregory Jones, “Introduction: Why Narrative?,” in *Why Narrative? Readings in Narrative Theology*, ed. Stanley Hauerwas and L. Gregory Jones (Eerdmans Publishing Co., 1989), 1–2.

224. *ibid.*, 4.

225. Lucie-Smith, *Narrative Theology*, 2.

226. *ibid.*, 74.

holding out the promise of universal moral norms.²²⁷ While Lucie-Smith focuses mainly on developing a biblical hermeneutic,²²⁸ an emphasis on narrative is often accompanied by an attention to the moral life. Though he eschews categorisation as a virtue ethicist,²²⁹ Stanley Hauerwas immediately comes to mind as a thinker at the intersection of story and virtue.²³⁰ Take, for example, his claim that

The moral life is not simply a matter of decision governed by publicly defensible principles and rules; we can only act in the world we see, a seeing partially determined by the kind of beings we have become through the stories we have learned and embodied in our life plan.²³¹

Narrative is bound up with character, community and witness in Hauerwas' ecclesiology, which sees the imitation of God as the primary vocation of the church.²³² By attending to the narrative of Jesus' life we learn perfection from him, a learning process that Hauerwas argues can only be done as part of a community that practises virtues. As the "historical Jesus" is impossible to know abstracted from the response of his followers, Hauerwas argues that we ought instead to pay more attention to the narrative of Jesus' life recounted in the gospels. It is significant that the early Christians witnessed through the re-telling of Jesus' life, rather than prioritising structured Christologies that focused on ontological claims. Christians are made a part of God's continuing story, and for any continuation of that story to be valid it must model Christ's story.²³³ Though Hauerwas does not use the term imagination, surely his linking of moral action to a story-shaped perception of the world depends on the imaginative faculty.

227. *ibid.*, 165. Of course, this runs counter to Johnson's view of morality expressed in the previous section.

228. Thus the examples he gives in the final chapter both involve interpreting specific scriptural passages (*ibid.*, 199–206).

229. While it is beyond the scope here to consider the category of virtue ethics more generally, Jennifer Herdt offers a helpful analysis of the reasons behind Hauerwas' aversion to the category (Jennifer Herdt, "Hauerwas Among the Virtues," *Journal of Religious Ethics* 40, no. 2 (2012), 212–213).

230. Surveying the development of Hauerwas' engagement with the virtues, however, Jennifer Herdt makes the convincing argument that his early focus on character and moral agency are replaced over time with the categories of community, tradition, and narrative (*ibid.*, 210).

231. Stanley Hauerwas, "The Self as Story: A Reconsideration of the Relation of Religion and Morality from the Agent's Perspective," *Journal of Religious Ethics* 1 (1973), 74.

232. Stanley Hauerwas, *The Peaceable Kingdom: A Primer in Christian Ethics* (University of Notre Dame Press, 1983), 76–86.

233. *ibid.*, 76–86.

Hauerwas' own emphasis on narrative brings to mind the work of Alasdair MacIntyre, who identifies humans as "story-telling animals". "I can only answer the question 'What am I to do?' if I can answer the prior question 'Of what story or stories do I find myself a part?'"²³⁴ Our ability to reason morally is developed within the context of our social relationships and early dependencies on others.²³⁵ Johnson connects MacIntyre's ideas of narrative to a fuller theory of imagination, arguing that "whatever human rationality consists in, it is certainly tied up with narrative structure and the question for narrative unity".²³⁶

We also see narrative at work theologically (more accurately, from the perspective of analytical philosophy) in the defence Stump presents for God's allowing of suffering. Stump contends that "narrative has a role to play in the discussion of certain philosophical issues, and what it contributes is not reducible to non-narrative philosophical explanation or expressible in non-narrative philosophical prose".²³⁷ Stump uses a selection of biblical narratives to illustrate a possible defence for the presence of suffering in a world created by God.

This all suggests that Hefner might find more helpful resources to articulate his theological anthropology were he to follow Nancey Murphy's epistemological lead away from Lakatos in the direction of MacIntyre. While MacIntyre's tradition-dependent rationality is not without its problems, he at least accords due significance to narrative and seeks to preserve some kind of truth-claim within that framework.²³⁸ Additionally, though the broader field of bioethics has been approached previously

234. Alisdair MacIntyre, *After Virtue*, 2nd ed. (University of Notre Dame Press, 1984), 216. A similar position is presented in Charles Taylor, *The Language Animal: The Full Shape of the Human Linguistic Capacity* (Belknap Press, 2016). Hauerwas was already focused on narrative theology before the publication of MacIntyre's major works on the subject, so there is unlikely to be a direct correspondence. Hauerwas acknowledges the significant influence of MacIntyre for his work on virtue and politics, however, though his reading is broad and he is at least as indebted to John Howard Yoder, Iris Murdoch and Aquinas, among others (Stanley Hauerwas, *Hannah's Child: A Theologian's Memoir* (Eerdmans Publishing Co., 2010), 68, 86, 160).

235. Alisdair MacIntyre, *Dependent Rational Animals: Why Human Beings Need the Virtues* (Duckworth, 1999), 81–83.

236. Johnson, *The Body in the Mind*, 172.

237. Eleonore Stump, *Wandering in Darkness: Narrative and the Problem of Suffering* (Oxford University Press, 2010), 22.

238. We see this in MacIntyre's discussion of the requirements narrative must fulfil in order to resolve epistemological crises (Alasdair MacIntyre, *Whose Justice? Which Rationality?* (Duckworth, 1988), 362).

from a narrative theological perspective,²³⁹ human enhancement specifically has not been considered in the discourse.

The fundamental quality of story-telling and story comprehension as a human trait is driven home when we consider how poorly artificial intelligence has been able to “understand” narratives thus far. Hubert Dreyfus contends that AI researchers have laboured under a false cognitivist paradigm, thus overlooking the important point that processing facts is very different to comprehending stories.²⁴⁰

The Moral Value of Literature

The narrative structure of our own lives and cognitive processes is what gives fiction such power in developing our moral sensitivity.²⁴¹ “Fictional narratives provide us rich, humanly realistic experimental settings in which we can make our own moral explorations”.²⁴² We have seen in the previous chapter how Tolkien and others valued the truth-telling capacity of fantasy fiction. The role of the humanities and the arts in reflecting on science and technology has already been highlighted. Literature is perhaps best positioned to do this, more so than propositional theological or philosophical writings – van der Laan considers science fiction in particular to be the “ideal vehicle for a critique of science and technology”.²⁴³ In chapter one of this work, the various purposes and functions of science fiction were briefly discussed. In his exploration of Mary Shelley’s *Frankenstein* and its ongoing relevance to how we think about science and technology, van der Laan writes that

239. Greek Orthodox theologian Tristan Engelhardt, confronting what he describes as the “irremedial plurality of postmodernity”, rejects any claim to rationality in his grounding of Christian bioethics in liturgy (H. Tristan Engelhardt Jr, *The Foundations of Bioethics*, 2nd ed. (Oxford University Press, 1996), 9, 103–104, 167). For Engelhardt, meaning is conveyed in a “content-full moral context” which appears to equate to the narratives operating in a particular tradition or community (*ibid.*, 277).

240. Hubert Dreyfus, “Overcoming the Myth of the Mental: How Philosophers Can Profit from the Phenomenology of Everyday Expertise,” *Proceedings and Addresses of the American Philosophical Association* 79, no. 2 (2005), 48.

241. Johnson, *Moral Imagination*, 197.

242. *ibid.*, 198.

243. Laan, “Editor’s Notes”, 233.

the meditative thinking of literature as exemplified in *Frankenstein* offers an alternative and counterbalance, maybe even an antidote, to the calculative thinking of science and technology, possibly even a rescue from its dangers.²⁴⁴

Treating speculative fiction as a serious subject of study is a step in the right direction. According to van der Laan, we must push back against the subordination of literature below the scientific-technological worldview, exemplified in C. P. Snow's famous "Two Cultures" speech.²⁴⁵ Robinson, too, challenges the naturalistic model that rejects historical thinking, religious and theological, about the meaning of human existence, highlighting the degradation of the moral imagination that comes with such neglect.²⁴⁶

Imagination, literature and virtue have been more closely associated in the past. Brian Stock draws attention to the way the ancients read texts, giving careful contemplation to the vision presented by a text after reading in order to grow in the virtues.²⁴⁷ Bieber Lake demonstrates the significance of the moral narrative for today in conveying larger visions by setting two narrative accounts alongside one another. Lee Silver and Flannery O'Connor both describe encounters with circus "freaks", but whereas Silver draws on the experience to bolster a scientific naturalist rejection of the soul and "spiritualist" interpretations of human being, O'Connor's similar encounter increases the imaginative possibilities of what it means to be human.²⁴⁸

Narrative and imagination are also connected to ethics – the imagination facilitates an emotional engagement with a particular narrative. According to Ward, this complements arguments put forward by Hauerwas and others that "wish to show how narrative can function both as a form of rationality and a shaper of character".²⁴⁹ Trevor Hart writes of the relationship between literature and ethics that

244. J.M. van der Laan, "Frankenstein as Science Fiction and Fact," *Bulletin of Science, Technology & Society* 30, no. 4 (2010), 303.

245. Laan, "Editor's Notes", 233; c.f. C. P. Snow, *The Two Cultures* (Cambridge University Press, 1998).

246. Marilynne Robinson, *Absence of Mind: The Dispelling of Inwardness from the Modern Myth of the Self* (Yale University Press, 2011), 32.

247. Brian Stock, "Ethics and the Humanities: Some Lessons of Historical Experience," *New Literary History: A Journal of Theory and Interpretation* 36, no. 1 (2005), 11.

248. Lake, *Prophets of the Posthuman*, 34–40.

249. Graham Ward, "Narrative and Ethics: The Structures of Believing and the Practices of Hope," *Literature and Theology* 20, no. 4 (2006), 455.

The imaginary cannot finally escape its genesis in the world of our actual experience, no matter how far the flights of analogical fancy may carry us, and like it or intend it or not, therefore, the artist is in some sense his ethical brother's keeper after all.²⁵⁰

This is demonstrated more fully by Steve Walker, who argues that Tolkien's main achievement in creating Middle-earth is the encouragement the reader receives to participate in the sub-creation.²⁵¹ We accept Tolkien's world as a vision of larger reality.²⁵² "Experiencing the subcreatings of Middle-earth makes us more capable of this-worldly creation, compounds our capacity for seeing the infinite potential not only in fiction but in life."²⁵³ Le Guin similarly upholds the power of narrative to shape virtue, writing that "ethics flourishes in the timeless soil of Fantasy, where ideologies wither on the vine".²⁵⁴ Great fantasies often contain a moral dialectic, points out Le Guin, a motif of Light vs Darkness.²⁵⁵ This is because "fantasy is the natural, the appropriate, language for the recounting of the spiritual journey and the struggle of good and evil in the soul".²⁵⁶ Thus Le Guin heralds science fiction author Philip K. Dick as a prophet, not because of his technological prescience, but rather because of the clarity of his moral vision.²⁵⁷

Beyond the more obviously imaginative capacity of fantasy literature, Martha Nussbaum describes the impact a tragedy may have for moral philosophy:

... it lays open to view the complexity, the indeterminacy, the sheer difficulty of actual human deliberation. ... A tragedy does not display the dilemmas of its characters as pre-articulated; it shows them searching for the morally salient; and it forces us, as interpreters, to be similarly active.²⁵⁸

250. Trevor Hart, "Creative Imagination and Moral Identity," *Studies in Christian Ethics* 16, no. 1 (2003), 13.

251. Steve Walker, *The Power of Tolkien's Prose: Middle-Earth's Magical Style* (Palgrave Macmillan, 2009), 7.

252. *ibid.*, 25.

253. *ibid.*, 173.

254. Ursula Le Guin, "European SF: Rottensteiner's Anthology, the Strugatskys, and Lem," *Science Fiction Studies* 1, no. 3 (1974), 183.

255. Ursula Le Guin, "The Child and the Shadow," in *The Language of the Night: Essays on Fantasy and Science Fiction*, ed. Susan Wood (Putnam, 1979), 65.

256. *ibid.*, 68.

257. Ursula Le Guin, "The Modest One," in *The Language of the Night: Essays on Fantasy and Science Fiction*, ed. Susan Wood (Putnam, 1979), 178.

258. Martha Nussbaum, *The Fragility of Goodness: Luck and Ethics in Greek Tragedy and Philosophy* (Cambridge University Press, 1986), 14.

Nussbaum holds up the novel as particularly illuminating for enquiries into the human good, describing the narrative and emotional structures of novels as “forms of Aristotelian ethical thinking”.²⁵⁹

Within the context of medical ethics, P. Anne Scott argues that the moral imagination that is essential for practising medicine can be stimulated and nurtured through the “serious reading of literature”.²⁶⁰ Only by attending to this moral imagination, which Scott suggests is a composite faculty akin to an Aristotelian intellectual virtue, can practitioners develop the understanding and compassion required to treat their patients properly as persons.²⁶¹ She therefore calls for literature to be incorporated into medical and nursing curricula.²⁶² Shippey, in the parallels he draws between fictional explorations of evil offered by writers as diverse as Le Guin, Kurt Vonnegut, George Orwell, and Tolkien, summarises the common way in which they reflect on personal experience through fiction. They are “trying to explain something at once deeply felt and rationally inexplicable, something furthermore felt to be entirely novel and not adequately answered by the moralities of earlier ages”.²⁶³ The writing and reading of fiction functions as a type of moral activity in these instances. Hart makes an even stronger case, suggesting that

a training in the ‘art of understanding’ ought always to incorporate engagement with imaginative literature of one sort or another as a means to the cultivation of a disciplined imagination.²⁶⁴

259. Martha Nussbaum, “Transcending Humanity,” in *Love’s Knowledge: Essays on Philosophy and Literature* (Oxford University Press, 1990), 390–391. Speaking on a more personal level, in an attempt to respond to the systemic sexual abuse perpetuated by renowned Mennonite theologian John Howard Yoder, Stanley Hauerwas considers what is absent from Yoder’s theology. It is the *moral imagination* that Yoder lacks, argues Hauerwas, the acknowledgement that training in virtue is essential, and that the imagination is important for this (Stanley Hauerwas, “In Defence of ‘Our Respectable Culture’: Trying to Make Sense of John Howard Yoder’s Sexual Abuse,” *ABC Religion and Ethics*, 18 October 2017, <http://www.abc.net.au/religion/articles/2017/10/18/4751367.htm>). Though he concedes that the point is “tendentious”, Hauerwas highlights Yoder’s disdain for novels as a factor in his moral deficiency, contending that “novels are an exercise in the enrichment of the imagination through which we develop the empathy that is crucial for the acquisition of the virtues” (*ibid.*).

260. P. Anne Scott, “Imagination in Practice,” *Journal of Medical Ethics* 23, no. 1 (1997), 49.

261. *ibid.*, 47.

262. *ibid.*, 50. Of course, she acknowledges the practical barriers to introducing more content into already crowded curricula.

263. Shippey, *J. R. R. Tolkien: Author of the Century*, 120.

264. Trevor Hart, “Imagination and Responsible Reading,” in *Renewing Biblical Interpretation*, ed. Craig Bartholomew, Colin Greene, and Karl Möller (Paternoster Press, 2000), 316.

5.4.2 What Is the Good Life?

It is all very well to talk of disciplining the imagination, but to what end? Discourse surrounding human enhancement technologies rarely asks the question: what constitutes a good life?²⁶⁵ Will the use of enhancement technologies promote human flourishing? Graham suggests that emerging cybernetic, digital and genetic technologies “call into question the deepest assumptions underlying our notions of normative and exemplary humanity”.²⁶⁶ Probes into these underlying assumptions have tended to focus on the status of human nature (i.e. determined or plastic),²⁶⁷ rather than the more abstract questions concerning human flourishing. A recently published collection of essays that addresses human flourishing as it relates to morphogenesis (altering human biological structures) serves as somewhat of a corrective, however it does not examine the the question particularly with respect to transhumanist and secular humanist perspectives.²⁶⁸ In the volume, however, Philip Gorski does make the point that “posthuman” visions can only be properly evaluated by comprehending their appropriation of theories of human flourishing.²⁶⁹ Elsewhere, a preliminary study of flourishing in the context of human enhancement has been offered particularly through the lens of disability studies.²⁷⁰ Carol Taylor and Roberto Dell’Oro have collated a range of Christian theological treatments of flourishing in relation to bioethics more generally that offers important resources,²⁷¹ but they do not focus on human enhancement, nor do they interrogate differing worldviews. Jonathan Cahill does identify some elements of the transhumanist

265. Lake, *Prophets of the Posthuman*, 9.

266. Graham, “Bioethics after Posthumanism”, 179.

267. E.g. see Gerald McKenny, “Biotechnology and the Normative Significance of Human Nature: A Contribution from Theological Anthropology,” *Studies in Christian Ethics* 26, no. 1 (2013).

268. Margaret Archer, ed., *Morphogenesis and Human Flourishing* (Springer, 2017).

269. Philip Gorski, “Human Flourishing and Human Morphogenesis: A Critical Realist Interpretation and Critique,” in *Morphogenesis and Human Flourishing*, ed. Margaret Archer (Springer, 2017). “Posthuman” is employed here to convey a similar notion to “transhuman”.

270. Miriam Eilers, Katrin Grüber, and Christoph Rehmann-Sutter, eds., *The Human Enhancement Debate and Disability: New Bodies for a Better Life* (Palgrave Macmillan, 2014).

271. Carol Taylor and Roberto Dell’Oro, eds., *Health and Human Flourishing: Religion, Medicine, and Moral Anthropology* (Georgetown University Press, 2006).

perspective on human flourishing in a short article, however he focuses on their eschatological claims rather than an overall picture of the good life.²⁷²

Given the proliferation of human enhancement technologies and advocacy, addressing this neglect can only enrich contemporary discourse both on the good life and on the ethics of enhancement. Responses to human enhancement technology are derived from, and therefore may illuminate, underlying notions of what human flourishing ought to look like. While an analysis of the visions of the good life that support various attitudes toward human enhancement is beyond the present scope, it is worth considering whether technology is compatible with human flourishing.

Technology itself is not necessarily in opposition to human flourishing. As Christina Bieber Lake points out, reflecting on the lessons from Nathaniel Hawthorne's short story "The Birth-mark", "it is thinking scientifically and technologically *first* about solving human problems that can do the greatest damage to persons as persons within relationships".²⁷³ Turning to technology first to solve problems circumvents the cultivation of virtue, but this does not deny a place for technology in promoting human flourishing. In 1960, looking ahead to the potential of technology to address social ills, Charles Coulson warned that positive changes as a result of technology "are possible only if we have a worthy view of man".²⁷⁴ Without such a view, technology may produce "infinite harm", with it "it may become a tool in the shaping of the Kingdom of Heaven on earth".²⁷⁵

Considering the ends to which technology is employed in transhumanist thought, Bieber Lake contends that:

to define transcendence as the inevitable outcome of technologically driven human evolution represents not only a phenomenon unique to the twentieth and twenty-first centuries but also a rejection of thousands of years of philosophical and theological thinking about what constitutes the highest and best life available to human beings.²⁷⁶

272. Jonathan Cahill, "Freedom for Life: Karl Barth, Transhumanism and Human Flourishing," *Ethics and Medicine: An International Journal of Bioethics* 30, no. 2 (2014), 81–95.

273. Lake, *Prophets of the Posthuman*, 54, emphasis original.

274. Charles Coulson, *Science, Technology and the Christian* (Epsworth Press, 1960), 103.

275. *ibid.*, 103.

276. Lake, *Prophets of the Posthuman*, xii.

Bieber Lake finds transhumanism wanting because of its inadequate vision of human flourishing.

transhumanism offers a false path to the good life. Transhumanism is wrong not because it promotes change, but because it promotes a dangerously thin definition of the good life, as if to be healthier, have a longer life, or experience less suffering will necessarily amount to a better life.²⁷⁷

Bieber Lake goes on to identify narrative as the only place in which we can flesh out what a good life ought to look like, for both humans and “posthumans”.²⁷⁸ She is not ruling out human enhancement in a rejection of transhumanism, simply countering the technological paradigm in which transhumanists operate, and the resultant understanding (or lack of) of the good life. It is interesting that Sandberg explicitly connects the lack of reflection on greater questions of human flourishing that surround enhancement issues with a lack of engagement with “great stories”,²⁷⁹ suggestion that narrative and imaginative approaches have an important role to play.

5.5 Sub-Creation as a Response to Human Enhancement Issues

Tolkien as a writer did not shy away from these “great stories” as a way of exploring and expressing truths of the human condition. As Hart reminds us, the *Ainulindulë* myth, though a fictional representation of angelic creativity, does convey how Tolkien thinks about human artistry.²⁸⁰ Tolkien certainly harboured hope that his idea of sub-creation applied in the real world as well as the secondary world he created, but we are venturing into speculative territory by acknowledging such a possibility. Again, we must take care in speaking of Tolkien’s particular theological views. While we know he remained faithful to the Catholic tradition throughout his life, he did not consider himself to be a theologian, and rarely spoke explicitly about doctrine. In particular, we must not read Tolkien’s writings as directly corresponding to a Christian worldview (e.g. by equating the *Ainulindulë* with the creation

277. *ibid.*, 172.

278. *ibid.*, 172.

279. Sandberg, “Transhumanism and the Meaning of Life”, 8.

280. Hart, “Tolkien, Creation, and Creativity”, 49.

account in Genesis, and thus reading a dualistic or polytheistic interpretation into Tolkien's theology).²⁸¹ It is more helpful to recognise the sacramental character of Tolkien's faith, its value of art and beauty for their own sake, and the freedom these affirmations gave him to imagine and inhabit worlds of his own invention.

The remainder of this work, therefore, explores how Tolkien's sub-creation proposal might inform real world activity in theological perspective, all the while remembering that this goes beyond what Tolkien claimed with any assuredness. Going forward, Flieger's description of Tolkien's vision for the redemption of his Secondary World is taken as a starting point for thinking about human creativity in our own world:

... In a flawed and faulty Creation it is the task appointed for flawed and faulty human beings – struggling with the world around them, sometimes making false starts, often following twisting paths of which they themselves cannot always see the ends – to lead themselves and that world out of error and into light.²⁸²

5.6 Tolkien's Sub-creation vs. Hefner's Co-Creation

As Hefner very clearly does claim the created co-creator designation as applicable to human activity in our world, we might begin by comparing the two approaches. Few scholars have set Hefner's co-creation and Tolkien's sub-creation against one another in even the briefest of comparisons. Peterson argues that sub-creation and co-creation have similar theological connotations, but differ in a slight but significant way:

To sub-create is to imitate or to work on what has already been thought out. It may imply initiative on the local level, but it reminds us that the master task always belongs to God. The implication of co-creator, however, is radically different, for it suggests that we are as much in control or responsible for creation as God is. It suggests that there is no blueprint for the future; the future is open, not determined.²⁸³

281. Hart, "Tolkien, Creation, and Creativity", 43.

282. Flieger, "The Music and The Task", 40.

283. Peterson, "The Created Co-Creator", 829.

Peterson may claim more for human creativity than Hefner intends in his interpretation, however this is a common criticism of the created co-creator.²⁸⁴ Both Hefner's co-creation and Tolkien's sub-creation acknowledge that human creativity is contingent on and derivative of God's creative activity.²⁸⁵ Hefner's choice of terminology emphasises the fact that humans are created beings, even as they are creators. Tolkien wishes to highlight this also, noting that "we make in our measure and our derivative mode, because we are made: and not only made, but made in the image and likeness of a Maker".²⁸⁶ Hefner explicitly identifies the capacity of humans to co-create with the *imago Dei*;²⁸⁷ Tolkien seems to be making the same point. Certainly, Deirdre Green attributes to Tolkien the belief that the human creative impulse is derived from their having been made in the Creator's image.²⁸⁸

Yet sub-creation does not merely offer a terminological refinement of alternative co-creation theologies. What does Tolkien's proposal contribute that is not sufficiently supplied by Hefner's thought? Where sub-creation departs from co-creation is its emphasis on the existence of divine norms, or templates, to human creativity. Charles Birch provides a helpful analogy:

A note on a tuning fork elicits a response from a piano because the piano already has in it a string tuned to the same note. The individual entities of creation have within their subjective nature "strings" tuned to the persuasive influence of God for their immediate future.²⁸⁹

The work of sub-creation respects the true nature of the subject, even while developing it toward its imagined purpose. "By the forging of Gram cold iron was revealed; by the making of Pegasus horses were ennobled".²⁹⁰ Thus bad sub-creation is a perversion of an essence; Orcs, for example, are described as "rational incarnate creatures, though horribly corrupted" by Melkor.²⁹¹

284. Case-Winters, "Rethinking the Image of God", 821.

285. Hefner, *THF*, 39.

286. *OFS*, 56.

287. Hefner, "Biocultural Evolution", 347.

288. Greene, "'Higher Argument'", 48–49.

289. Charles Birch, "Neo-Darwinism, Self-Organization, and Divine Action in Evolution," in *Evolutionary and Molecular Biology: Scientific Perspectives on Divine Action*, ed. Robert J. Russell, William R. Stoeger, and Francisco J. Ayala (Vatican Observatory & CTNS, 1998), 244.

290. *OFS*, 59.

291. *Letters*, 190.

Hart, speculating over the various revisions Tolkien made to the *Ainulindalë*, suggests that he was especially sensitive to claiming too much for human creativity. He reads Tolkien's adjustments as a desire to avoid "an unacceptable blurring of the boundaries between divine and creaturely prerogatives" (i.e. the very sin of Melkor).²⁹² As discussed previously, Tolkien was acutely aware of the potential for "creative desire" to be corrupted. Sub-creation "may become possessive, clinging to the things made as 'its own', the sub-creator wishes to be the lord and God of his private creation."²⁹³

Finally, Tolkien's notion of sub-creation does full justice to the role of the imagination in human co-creativity. Tolkien rejects the constraints of a scientific anthropology that limits Hefner's approach. He does not shy away from claiming certain knowledge that cannot be explained through reason alone. In his refusal to set reason and the imagination against one another, there is room in his epistemology to consider aspects of human creativity, particularly in relation to divine creativity, that cannot be articulated in scientific terms.

5.7 Tolkien and Technology

Where Hefner may have the advantage over Tolkien is in his general openness to technology. At first glance, Tolkien is an unlikely interlocutor when it comes to a consideration of the role of technology in human creative activity. Many of Tolkien's writings expresses his concerns over developments in technology during his own lifetime. Carpenter offers the amusing anecdote of how Tolkien, towards the end of his life, scrawled "Not a penny for Concorde" emphatically across one of his tax cheques.²⁹⁴

Though Tolkien believed that Fantasy and science were mutually enriching, he likely also shared fellow Inkling Owen Barfield's concerns that the scientific approach was encroaching on the imaginative sphere: "first they insist on cutting out awe and reverence and wisdom and substituting sophistication as the goal of

292. Hart, "Tolkien, Creation, and Creativity", 51.

293. *Letters*, 145.

294. Carpenter, *J. R. R. Tolkien*, 244.

knowledge; and then they talk about this method with reverence and awe. . . .”²⁹⁵ In one of his letters, he equates the modern manifestation of the “evil spirit” in the world with mechanism and “scientific” materialism.²⁹⁶

Toward some of the aims of transhumanism in particular, Tolkien might have been especially critical. Wood suggests that “in the Sauronic temptation to live longer but not better, Tolkien is offering his own critical commentary on our death-fearing, life-worshipping culture.”²⁹⁷ Schick explicitly addresses the subject of emerging technologies in connection with Tolkien; though he focuses on the symbolism of the Ring rather than the proposal of sub-creation.²⁹⁸ Catherine Madsen reminds us of how prominent loss and a sense of fading is in Tolkien’s work. *LOTR* is not only a story of how the Ring is unmade, but also of how the Elves disappeared from Middle-earth, making way for the Dominion of Men.²⁹⁹ This sense of finitude, and even of tragedy, does not seem at all compatible with a transhumanist perspective.

It would be easy to discount Tolkien as opposed to technology in the way that older generations are often suspicious of new developments, however Tolkien appears to have been quite reflective on the matter. How Tolkien primarily views technology is seen in his definition of the “Machine” as

all use of external plans or devices (apparatus) instead of development of the inherent inner properties or talents – or even the use of these talents with the corrupted motive of dominating: bulldozing the real world, or coercing other wills.³⁰⁰

Furthermore, this “Machine” is the end result of the desire for Power that stems from possessive and hubristic sub-creation.³⁰¹ The misuses and abuses of technology are insidious, and often spring from good intentions.

295. Owen Barfield, *Worlds Apart: A Dialogue of the 1960’s* (Wesleyan University Press, 1964), 21–22.

296. *Letters*, 110.

297. Wood, “Tolkien’s Augustinian Understanding”, 90.

298. Theodore Schick, “The Cracks of Doom: The Threat of Emerging Technologies and Tolkien’s Rings of Power,” in *The Lord of the Rings and Philosophy: One Book to Rule Them All*, ed. Gregory Bassham and Eric Bronson (Open Court, 2003). His discussion is rather ambivalent, with no real conclusion concerning how we are to think about the emerging technologies he references.

299. Catherine Madsen, “‘Light From an Invisible Lamp’: Natural Religion in *The Lord of the Rings*,” in *Tolkien and the Invention of Myth: A Reader*, ed. Jane Chance (University of Kentucky Press, 2004), 42.

300. *Letters*, 145–146.

301. *Letters*, 145.

The Enemy in successive forms is always ‘naturally’ concerned rather with sheer Domination, and so the Lord of magic and machines; but the problem: that this frightful evil can and does arise from an apparently good root, the desire to benefit the world and others – speedily and according to the benefactor’s own plans – is a recurrent motive.³⁰²

Saruman was mentioned earlier as an example of corrupted sub-creation at work. In an etymological analysis of the name “Saruman”, Tom Shippey suggests it conveys more than just the notion of “cunning man”, but a kind of mechanical ingenuity, a “smithcraft developed into engineering”.³⁰³ Saruman represents the extreme manifestation of a sickness also present in Sandyman, the miller in the Shire. This disease, according to Shippey, “starts as an intellectual curiosity, develops as engineering skill, turns into greed and the desire to dominate, corrupts further into a hatred and contempt of the natural world which goes beyond any rational desire to use it”.³⁰⁴

Part of the disenchantment Tolkien accorded to technology (specifically in the context of war), argues Garth, is the notion that effort is rendered meaningless by failure. Worth was no longer intrinsic – instinctive and inspirational values that required upholding – rather it was attached to end results.³⁰⁵ For Tolkien, the dangerous human preoccupation with technology

sticks out so plainly and is so horrifyingly exhibited in our time, with its even worse menace for the future, that it seems an almost worldwide mental disease that only a tiny minority perceive it.³⁰⁶

The Hobbit lifestyle is depicted as ideal – the Shire abounds in gardens, trees, and farms cultivated without the use of machinery. Its residents enjoy the simple pleasures of good plain food and a pipe.³⁰⁷ It is for this reason that Hobbits were chosen to bear the Ring – they alone could resist its power because ambition was not a part of their nature.³⁰⁸ In *LOTR*, the replacement of the water-mill in the Shire

302. *Letters*, 146.

303. Shippey, *J. R. R. Tolkien: Author of the Century*, 170.

304. *ibid.*, 171.

305. Garth, *Tolkien and the Great War*, 303.

306. *Letters*, 88.

307. Tolkien identifies himself as a Hobbit, finding enjoyment in the same pleasures (*Letters*, 288–289).

308. *Letters*, 158.

with its industrial equivalent, seen by Sam in the Mirror of Galadriel, is described as “devilry”.³⁰⁹ It is no coincidence that Sam is the gardener of the tale. The gardening metaphor is used throughout Tolkien’s works to illustrate his understanding of sub-creation. Even more illuminating, perhaps, is the fact that Tolkien regarded Samwise as the true hero of *LOTR*.³¹⁰ Alun Morgan highlights Sam as the exemplar for the virtue of stewardship in the tale, connecting his role as gardener with a heightened appreciation of human solidarity with the natural world.³¹¹

Joshua Hren identifies in Tolkien’s work a diagnosis of the same “technocratic paradigm” that Pope Francis critiques in the 2015 encyclical *Laudato si*.³¹² In such a paradigm, the scientific method is the primary methodology, and the goal is control, mastery and manipulation.³¹³ In Tolkien’s writings, this approach to technology is represented as “the Machine”, described above. The Ring itself symbolises for Tolkien “the will to mere power, seeking to make itself objective by physical force and mechanism, and so inevitably by lies”.³¹⁴ Hren detects an echo of Heidegger’s analysis of modern technology – the use of the Ring to impose force over others (and objects) results in the treatment of these others and objects as a “standing reserve”.³¹⁵ In our increasing dependence on machines and technology, our wills become “standing reserve” in much the same way that the Ring draws to itself and masters the wills that use it.

Also drawing parallels between Tolkien and Heidegger, Simon Malpas argues that the two scholars shared a common struggle to understand community in the context of rapid industrialisation and technological growth.³¹⁶ Heidegger’s famous notion of the “standing reserve” (*Bestand*),³¹⁷ in which everything (including

309. *FR*, 278.

310. *Letters*, 161.

311. Alun Morgan, “The Lord of the Rings - A Mythos Applicable in Unsustainable Times?,” *Environmental Education Research* 16, nos. 3-4 (2010), 396.

312. Joshua Hren, “Tolkien and the Technocratic Paradigm,” *New Blackfriars* 99, no. 1079 (2018), 97.

313. *ibid.*, 97.

314. *Letters*, 160.

315. Hren, “Tolkien and the Technocratic Paradigm”, 102.

316. Simon Malpas, “Home,” in *Reading The Lord of the Rings: New Writings on Tolkien’s Trilogy*, ed. Robert Eaglestone (Continuum, 2005), 86.

317. Martin Heidegger, “The Question Concerning Technology,” in *The Question Concerning Technology and Other Essays*, trans. William Lovitt (Harper Perennial, 1977), 19.

nature) is construed and conscripted for technological use, would likely have met with Tolkien's approbation.

Heidegger points us to the etymology of τέχνη. Τέχνη not only concerned the practical crafts in the early Greek context but also the arts. “*Techne* belongs to bringing-forth, to *poiesis*; it is something poietic.”³¹⁸ Heidegger additionally connects this to the Greek word ἀλήθεια, or “truth”, arguing that technology is a means of revealing truth.³¹⁹ While τέχνη and ποίησις have a traditional connection in meaning, modern technology has diverged from poetry away from “revealing” and toward “challenging-forth” (*Herausfordern*).³²⁰ Modern technology “puts to nature the unreasonable demand that it supply energy that can be extracted and stored as such.”³²¹

Tolkien grasped this same important truth that technology itself is not neutral. He illustrates this point in Boromir's arguments concerning the Ring, when he argues against its destruction and instead implores:

Why should we not think that the Great Ring has come into our hands to serve us in the very hour of need? Wielding it the Free Lords of the Free may surely defeat the Enemy.³²²

Gandalf and Galadriel, however, both refused to use, or even possess, the Ring, recognising that it would eventually corrupt them despite their good intentions. Even Elrond would not take the Ring to hide it, saying that “the very desire of it corrupts the heart”.³²³ For the Ring is the Machine *par excellence*. Malpas suggests that it might even be equated with the technological imperative itself; to rid the world of this imperative is thus Frodo's quest.³²⁴

Tolkien considers technology to be bound up with coercion, manifested most strongly in the wars of the twentieth century.³²⁵ Shippey describes the modern vice

318. Heidegger, “The Question Concerning Technology”, 13.

319. *ibid.*, 13. Although it should be noted that Heidegger later, in *Being and Time*, corrected the linking of ἀλήθεια with truth, speaking instead in terms of “disclosing”.

320. *ibid.*, 14.

321. *ibid.*, 14.

322. *FR*, 280–281.

323. *FR*, 281.

324. Malpas, “Home”, 88. Note that Malpas critiques a simplistic reading of *LOTR* as a victory over development, highlighting the tale's more ambivalent conclusion (*ibid.*, 88).

325. Wood, “Tolkien and Postmodernism”, 261.

detested by Tolkien as “a kind of restless ingenuity, skill without purpose, bulldozing for the sake of change”.³²⁶ Thus, Tolkien declares in “Mythopoeia”

I will not walk with your progressive apes
Erect and sapient. Before them gapes
The dark abyss to which their progress tends

He further rejects the technological worldview and makes his own stand.

Your world immutable wherein no part
The little maker has with maker’s art
I bow not yet before the Iron Crown,
Nor cast my own small golden sceptre down.³²⁷

From the above analysis it seems evident that Tolkien was very much opposed to technological progress.³²⁸ Sauron and Saruman offer obvious parables for the power of technology to possess and corrupt the will; yet a more subtle critique is offered through the character of Denethor. Denethor represents the relinquishment of hope, resignation in the face of technological enslavement. “The West has failed”, is Denethor’s mantra.³²⁹ It is perhaps not coincidental, however, that Denethor is also portrayed as vainglorious, angered by Gandalf’s reminder of his position as Steward, not Lord, of Gondor.³³⁰

So how are we to respond to an increasingly technological world, if not with the resignation of Denethor? As Malpas points out, Tolkien does not advocate a return to a pre-technological past; this is sentimental impossibility.³³¹ Shippey reads into Tolkien’s inclusion of rabbits, potatoes and tobacco in Middle-earth, despite their anachronistic nature as much later imports into the Northern archaic culture that pervades much of his work, an admission by Tolkien that some products of modernity are acceptable in an ideal world.³³² Yet there does seem to be a

326. Shippey, *J. R. R. Tolkien: Author of the Century*, 171. Despite his caution against allegorical reading, Shippey argues for a connection in *The Hobbit* between the goblins, and the agents of technological advancement in human history (*ibid.*, 187).

327. “Mythopoeia”, 89.

328. Whereas Heidegger sees art and technology as different kinds of *poiesis*, recognising technology as both valid and inevitable even as he calls for other modes of revealing to be acknowledged, Tolkien sees the Machine as the corruption of the artistic impulse.

329. *RK*, 128.

330. *RK*, 130.

331. Malpas, “Home”, 89.

332. Shippey, “Creation from Philology”, 296.

lingering nostalgia for Eden in Tolkien's thought. Bronislaw Szerszynski describes a particular view that is fitting:

From the late eighteenth century nature started to be seen in various ways as the unspoilt, as an Edenic arena of goodness and innocence, unsullied by the artifice, alienation and corruption of modern life . . . nature came to take on new sacral meanings, as a counterpoint to the increased technologisation of society.³³³

Tolkien does avow that

. . . certainly there was an Eden on this very unhappy earth. We all long for it, and we are constantly glimpsing it: our whole nature at its best and least corrupted, its gentlest and most humane, is still soaked with the sense of 'exile'.³³⁴

Flieger explores the complicated (and arguably contradictory) stance Tolkien took towards nature. In *LOTR*, she argues, the characters of Old Man Willow and Treebeard both act in similar ways and with similar motivations, striking out against those who would destroy parts of their forests.³³⁵ The orcs' felling of trees in Fangorn Forest, and the hobbits' chopping of the Old Forest at the border of the Shire are more similar than many readers might acknowledge.³³⁶ Even Lórien, represented as the ideal and aesthetically pleasing forest, is a *cultivated* forest, civilised rather than wild.³³⁷ This leads to a paradox in Tolkien's writings:

. . . civilization and nature are at undeclared war with one another. To make a place for itself, humankind will tame a wilderness whose destruction, and eventual eradication, however gradual, is at once an inevitable consequence and an irreparable loss.³³⁸

Lórien is exceptional, for the most part Tolkien sets human activity and technology against idyllic nature. This thread will be picked up further in the next chapter as we explore more contemporary treatments of technology.

333. Bronislaw Szerszynski, *Nature, Technology and God* (Blackwell Publishing, 2005), 102.

334. *Letters*, 110.

335. Verlyn Flieger, "Taking the Part of Trees: Eco-Conflict in Middle-Earth," in *J. R. R. Tolkien and His Literary Resonances*, ed. George Clark and Daniel Timmons (Greenwood Press, 2000), 156.

336. *ibid.*, 156.

337. *ibid.*, 155.

338. *ibid.*, 155–156.

Much of Tolkien's concerns about technology are inextricable from questions of power. Whether technology can be incorporated into Tolkien's sub-creation in any sense depends on how we understand technology, its relationship to us and to the world. If we can conceive of technology's essence as something other than Heidegger's *Gestell*, as Heidegger himself calls on us to do,³³⁹ this project may be advanced. The apparent incompatibility of Tolkien's views on technology with any kind of pragmatic response to human enhancement technologies will be treated further in the next chapter.

5.7.1 Theology and the Moral Imagination

What does this mean for our objective of developing a *theological* perspective for reflection on human enhancement? We have seen in chapter four how theologians have understood the importance of the imagination and narrative for their own work. In the present chapter we have considered more particularly how the imagination and Christian truth-claims are connected in fiction, and have explored the value of literature in shaping the moral imagination (which in turn shapes our response to particular concerns such as human enhancement). These threads are now brought together, in asking what place might theology occupy in a broader understanding of the moral imagination?

The theological symbols discussed in earlier chapters are not peculiar to theology. Avis, following the work of Jung, reminds us that "doctrines have their symbolic equivalents in the repertoire of humanity's symbolic inheritance".³⁴⁰ This is of immense importance if theologians are to enter into public dialogue, as is necessary when it comes to human enhancement. As Avis points out, even apart from theistic commitments regarding the imagination's ultimate source, the imagination nevertheless derives the power to inspire and motivate people in a transcendent sense from a long history of invocation in the aspirations of earlier generations.³⁴¹

339. Heidegger, "The Question Concerning Technology", 35.

340. Avis, *God and the Creative Imagination*, 112.

341. *ibid.*, 46.

The imagination's appeal and efficacy is not restricted to particular traditions of belief in the way that propositional accounts of truth often are.

For Tolkien, myth conveys meaning in its bringing together of many minds, all contemplating great human questions. Thus, he has Ramer, a character in "The Notion Club Papers", point out to his colleagues:

I don't think you realize, I don't think any of us realize, the force, the daimonic force that the great myths and legends have. From the profundity of the emotions and perceptions that begot them, and from the multiplication of them in many minds – and each mind, mark you, an engine of obscure but unmeasured energy.³⁴²

Clyde Kilby locates the power of *LOTR* in its recounting of "the sadness of a paradise lost and the glory of one that can be regained".³⁴³ This is not to say that we should read Tolkien's epic as a Christian text. Madsen cautions against making "an independent imagination a means to a religious end".³⁴⁴ Scott Moore, in an exploration of Tolkien's impact on the novelist Iris Murdoch, argues that for Murdoch the consolation of the ending of *LOTR* was "devoid of explicit religion".³⁴⁵ An atheist, albeit one attracted to mysticism, Murdoch was nevertheless able to recognise Tolkien's work as the embodiment of true moral vision.³⁴⁶ Wood, similarly, suggests that the *LOTR*'s success demonstrates that Christians are able to enter the "tournament of narratives", a phrase used by theologian James McClendon to describe the postmodern milieu.³⁴⁷

Donald Williams is more explicit when it comes to the linking of narrative and Christian truth. Referring to Tolkien's brief mention of the Gospels at the close of "On Fairy-stories", Williams emphasises that the incarnation, sacrifice

342. J. R. R. Tolkien, *Sauron Defeated: The End of the Third Age, The Notion Club Papers and the Drowning of Anadûnê*, ed. Christopher Tolkien, vol. 9, *The History of Middle-Earth* (HarperCollins, 1992), 228.

343. Clyde S. Kilby, "Mythic and Christian Elements in Tolkien," in *Myth, Allegory, and Gospel: An Interpretation of J. R. R. Tolkien, C. S. Lewis, G. K. Chesterton, Charles Williams*, ed. John Montgomery (Bethany Fellowship, 1974), 143.

344. Madsen, "Light From an Invisible Lamp", 36.

345. Scott Moore, "The Consolations of Fantasy: J. R. R. Tolkien and Iris Murdoch," in *Tolkien Among the Moderns*, ed. Ralph Wood (University of Notre Dame Press, 2015), 214.

346. *ibid.*, 215.

347. Wood, "Tolkien and Postmodernism", 273; James McClendon, *Systematic Theology: Ethics* (Abingdon Press, 1986), 143.

and resurrection of Christ fulfil not only prophecies in the Hebrew Scriptures, but also the plots of all great myths and fairy stories throughout human history.³⁴⁸ Humans could *only* be redeemed through story, argues Williams, as humans are story tellers by nature.³⁴⁹

In his discussion of how people convert by breaking out of the “immanent frame” to acknowledge an open system of reality, Taylor emphasises the appeal to the senses and feeling in response to the “cross-pressure” of the transcendent.³⁵⁰ Engaging Taylor’s *A Secular Age*, Smith suggests that the elasticity conferred on language as it came to be understood as generative rather than representative in the late eighteenth century “creates just enough openness to potentially rupture the closed take on the immanent frame”.³⁵¹ Imaginative writing can challenge and inform contemporary social imaginaries without containing explicitly theological content.

This is not to exclude the necessity of genuine theological discourse as well. Brent Waters speaks articulately of the need for Christians to present a counter narrative to that of “technoscience” when it comes to the human future.

This task need not be premised on the belief that Christians have a corner on truth and goodness, only that whatever they know about these qualities they know as Christians, however partial and imperfect that knowledge may be. Moreover, in telling this story with the vocabulary and grammar of this counter discourse, they may also endeavor to tell it in a way that enables, rather than disables, other quests for the good and the true undertaken by those who do not share their faith.³⁵²

Thus, Hefner’s call for the development of “imaginative frameworks of meaning” might be connected more strongly with theological claims about human and nonhuman nature.³⁵³ Combined with Tolkien’s much greater appreciation for the ability of story to express deep truths about reality (without resorting to heavy-handed propositional statements of theology), a vision of co-creation that derives from theological truth claims might be articulated imaginatively as part of a broader response to human enhancement questions.

348. Williams, *Mere Humanity*, 50.

349. *ibid.*, 50.

350. Taylor, *A Secular Age*, 729.

351. Smith, *How (Not) to Be Secular*, 136; c.f. Taylor, *A Secular Age*, 756–758.

352. Waters, *From Human to Posthuman*, xi.

353. See Hefner, “A Fuller Concept of Evolution”, 307.

Chapter Conclusion

Tolkien's theory of sub-creation, though primarily about constructing imaginary worlds, has the potential to inform our real-world understanding of human creativity. This implication of Tolkien's thought is somewhat underdeveloped, however it may offer a more nuanced understanding of the divine limits to co-creation that is lacking in other proposals, such as Hefner's created co-creator. Furthermore, Tolkien's understanding of sub-creation and its relation to mythopoiesis may correct the imaginative deficit identified in existing accounts of co-creation, permitting us more epistemological latitude as we seek to articulate a theological response to the questions surrounding human enhancement. Tolkien's wariness of technology is not easily dismissed, however, in bringing his thought into contemporary discourse. The final chapter will consider how Tolkien's (in conjunction with Hefner's) ideas might be challenged or supplemented by other relevant sources if it is to be of any value in thinking through theological perspectives on enhancing human traits with technology.

Part III

Seeking a Synthesis

Earlier chapters have concentrated on a deeper analysis of two specific approaches to co-creation theology, assessing their potential for dialogue with human enhancement questions. There are, it has been shown, various strengths to both Hefner's and Tolkien's conceptions of human creativity, and together these analyses have laid the foundation for further development. To bring these interlocutors into conversation with contemporary debates, however, it is now necessary to change gear, so to speak, and move away from these detailed appraisals to a wider view. This final part therefore presents a preliminary constructive proposal for co-creation theology, incorporating several new dialogue partners to locate this work's proposals with respect to pertinent contemporary discourses. Several markers of a more robust theological anthropology are described with the goal of constructive dialogue surrounding human enhancement questions, and the productivity of the proposed anthropology is established with respect to fruitful discourses abrogating false binaries of imagination and reason, nature and technology, mind and body.

*When we are lucky the fantastique offers a roadmap –
a guide to the territory of the imagination, for it is
the function of imaginative literature to show us the
world we know, but from a different direction.*

— Neil Gaiman

*You can't depend on your eyes when your imagination
is out of focus.*

— Mark Twain

6

Towards a Constructive Theological Response to Transhumanism

Contents

6.1	Overcoming Dichotomies of Thought in Co-Creation Theologies	228
6.2	A Vision of Moral Co-Creation	234
	Evolutionary Origins	234
	Centrality of Creativity	235
	Human/Divine Creativity?	238
	Scientific Engagement	239
	Technology is Creative	240
	Story-Telling and Myth-Making	248
	Moral Imagination	251
	Highlighting Embodiment	260
	Challenging Anthropocentrism	264
	Reclaiming Christian Visions	269

Chapter Overview

This chapter draws on various threads of scholarship that might enrich the co-creation theologies examined in Part II of this work. Iain McGilchrist’s work on the influence of brain lateralisation on the cultural and philosophical history of the West, George Lakoff and Mark Johnson’s studies on metaphor, and the French

phenomenological tradition on which both draw, are explored as potential resources to overcome the dichotomies of thought raised in the previous analysis of co-creation accounts. Emphasising the embodied dimension of “knowing” is underscored in this challenging of binary approaches. Posthumanist discourse is also examined for its similar ability to break down thought dichotomies.

If a theology of humans as co-creators is to contribute to reflection on human enhancement technologies, it must be embedded within a context that also attends to virtue. Technological enhancement can only be accommodated within this theological understanding of the human future if technology itself can be conceived of in a way that does not erode virtue, as Tolkien feared. This chapter turns its attention to the shaping of the moral imagination, to consider whether greater attention to the imaginaries in which technology is developed and implemented might suggest a way forward. If the stories and myths that feed our visions of the future are carefully cultivated, there may be room for certain “enhancing” technologies within a theologically orthodox conception of both human involvement in continuing creation and the eschatological future in which it hopes.

6.1 Overcoming Dichotomies of Thought in Co-Creation Theologies

It is worth pausing to take stock of the arguments developed thus far. Two theologies of co-creation have been examined to determine whether they might inform a theological response to the challenges of human enhancement technology. Hefner’s created co-creator model engages evolutionary science in its construction and adopts a generally positive stance toward the human use of technology in a God-given mandate to co-create. However, it does not attend sufficiently to the role of the imagination in our discernment regarding co-creation, or develop a robust account of virtue formation that can support such discernment. J. R. R. Tolkien’s alternative of sub-creation is underpinned by a strong sense of the imagination’s value in human creativity, yet he engages little with science and has a largely

negative view of technology, representing it as a threat to virtue.¹ The analyses of Hefner and Tolkien have revealed various dichotomies relevant to the present consideration of human enhancement. Rationality and imagination are continually set against one another, as are technological development and human morality. A sufficient model of co-creation must be able to reconcile or overcome these dualisms if it is to serve us in reflecting on the possibilities of human enhancement.

Humans have a tendency to construct dichotomies that do not entirely map onto the real world. The duality in the way that we approach the world is well-described in Iain McGilchrist's acclaimed *The Master and his Emissary*.² McGilchrist offers a grand narrative that locates the present tension between analytical and rational perspectives and "big-picture" syntheses in a reversal of particular hemispheric brain operations and their relationship with one another. According to McGilchrist, there are two "fundamentally opposed realities" or modes of experiencing the world that are rooted in separate hemispheres of the brain, and which have been locked in a "power struggle" that is key to understanding contemporary Western culture.³

McGilchrist characterises the left hemisphere approach to the world as:

verbal and analytic, requiring abstracted, decontextualised, disembodied thinking, dealing in categories, concerning itself with the nature of the general rather than the particular, and adopting a sequential, linear approach to truth, building the edifice of knowledge from the parts, brick by brick.⁴

1. This is not to suggest that there is no existing middle ground that is able to hold both the imagination and technology in high regard. Both transhumanists and science fiction writers and appreciators unite an imaginative outlook with an embrace of technology (not all science fiction writers of course, as some adopt a more pessimistic view of technology). As the project in hand concerns a *theological* reflection on human enhancement questions, however, neither transhumanist philosophy nor science fiction are sufficient resources in themselves, though they might inform theological responses.

2. McGilchrist, *The Master and his Emissary*.

3. *ibid.*, 3. McGilchrist argues the counter thesis to Julian Jaynes – whereas Jaynes located the origin of consciousness in the *breakdown* of the bicameral mind (i.e. two previously separate hemispheres merged), McGilchrist proposes inversely that it was actually the beginnings of the two hemispheres operating more independently of each other (*ibid.*, 262). While Hefner finds some value in Jaynes' model (see page 91 of this work), his understanding of myth and ritual as fundamental to human being is not dependent on a specific understanding of how consciousness arose.

4. *ibid.*, 137.

The right hemisphere, in contrast, “sees the whole”, and recognises patterns.⁵ It “sees each thing in its context, as standing in a qualifying relationship with all that surrounds it, rather than taking it as a single isolated entity”.⁶

Drawing on a fable that he attributes to Nietzsche, in which an emissary gradually comes to see himself in the role of the wise master he represents, McGilchrist suggests that in our contemporary experience the “emissary” (left hemisphere) has also apparently usurped the place of the “master” (right hemisphere). McGilchrist describes what he considers to be the current state of affairs:

An increasingly mechanistic, fragmented, decontextualised world, marked by unwarranted optimism mixed with paranoia and a feeling of emptiness, has come about, reflecting ... the unopposed action of a dysfunctional left hemisphere.⁷

While Enlightenment philosophy and the modern worldview feature prominently in McGilchrist’s account of this usurpation, he also highlights the Reformation as “the first great expression of the search for certainty in modern times”,⁸ with its shift away from religious imagery in favour of the word.⁹ McGilchrist cites the Cromwellian Revolution, the French Revolution and the rise of scientific materialism as examples of the left hemisphere’s ongoing “assault” on the right hemisphere’s world.¹⁰ However, it is in the Industrial Revolution, and particularly the increasing prevalence of *technology*, he argues, that “the innate structures of the left hemisphere” are “being incarnated in the world it has come to dominate”.¹¹

Though McGilchrist overreaches with respect to some of the scientific claims he makes, implying that neurological phenomena are *driving* complex social and intellectual changes,¹² his general description of Western culture as in thrall to

5. McGilchrist, *The Master and his Emissary*, 47–48.

6. *ibid.*, 49.

7. *ibid.*, 6.

8. *ibid.*, 315. Here, McGilchrist applies “modern” in the sense of “recent”, rather than in reference to the modern period.

9. *ibid.*, 315.

10. *ibid.*, 386.

11. *ibid.*, 387.

12. Kenan Malik points to McGilchrist’s problematic attribution of agency to each brain hemisphere, when it is only at the level of the whole person that awareness can be spoken of meaningfully (Kenan Malik and Iain McGilchrist, “Split Brain, Split Views: Debating Iain McGilchrist,” *Pandaemonium*, February 2013, <https://kenanmalik.wordpress.com/2013/02/24/split-brain-split-views-debating-iain-mcgilchrist/>).

a mechanistic and decontextualised rationality resonates. The metaphor of the master and the emissary, even untethered from specific claims concerning changes in brain lateralisation, is illuminating.¹³ In terms of the interlocutors considered in the current project, we can certainly identify in Hefner's methodology the tendency toward the reductive "brick by brick" approach that McGilchrist classifies as left hemisphere thinking. In the germ of imaginative insights in his thought, which remain underdeveloped and constrained by the scientific methodology he adopts, we see the dichotomy of rationality and imagination reified by Hefner.

McGilchrist attests to the impossibility, identified earlier, of articulating an alternative "truth" from the analytical using the tools of philosophy, restricted as they are by the particular limitations of philosophical discourse's terms of reference and epistemology.¹⁴ Yet the very attempt to do so, contends McGilchrist, witnesses powerfully to the reality of an alternate way of construing the world.¹⁵ He cites the phenomenological tradition as an example, reading in Edmund Husserl's notion of intersubjectivity, which challenges the dualism between the objective and the subjective, an assertion of "the essential role that the right hemisphere plays in constituting the world in which we live".¹⁶

It is in such an alternative that McGilchrist locates the potential for overcoming dichotomous thinking. Western philosophy has been given over to a left-hemisphere version of the world, he argues, and thus is dependent on a naturalising dichotomising approach, which sees the world in terms of "either/or". The chief governing principle of the left hemisphere is division, after all.¹⁷ Yet these dichotomies

13. To be fair, McGilchrist closes his book with an acknowledgement that the neurological specifics of his argument may prove unnecessary to an account of the history of human culture and philosophy, and would be content if his description of brain hemispheres were to serve only as a metaphor for the dichotomies we experience (McGilchrist, *The Master and his Emissary*, 461–462).

14. *ibid.*, 135. Eleanore Stump makes a similar point with her contrast of "Dominican" (propositional) and "Franciscan" (intuitive) approaches to knowledge, arguing that it is not fruitful to "attempt to show the philosophical importance of Franciscan knowledge by Dominican means" (Stump, *Wandering in Darkness*, 60).

15. McGilchrist, *The Master and his Emissary*, 135.

16. *ibid.*, 144.

17. *ibid.*, 137.

may cease to be problematic in the world delivered by the right hemisphere, where what appears to the left hemisphere to be divided is unified, where concepts are not separate from experience, and where the grounding role of ‘betweenness’ in constituting reality is apparent.¹⁸

James K. A. Smith is another thinker who challenges contemporary dichotomies, including that between reason and the imagination. In the third volume of his cultural liturgies trilogy, he envisions a public theology that rejects the perceived antithesis of church and state.¹⁹ Indeed, his larger project of identifying secular liturgies repudiates sharp distinctions between sacred and secular.²⁰ Like McGilchrist, Smith draws on the phenomenological tradition, referring to Maurice Merleau-Ponty’s notion of “preconscious knowledge”, which in turn borrows much from Heidegger’s “being-in-the-world”.²¹ This attests the “hybridity” of human being, challenging both Cartesian and animalist dichotomies of mind and body.²²

Affirming that our intellectual reflection is preceded by pre-conscious, bodily perceptions of the world, Smith then turns to the work of Pierre Bourdieu to consider how we might recruit the imagination in service of particular reflection (this will be taken up in the next section). A sociologist and anthropologist, Bourdieu’s work is mainly concerned with embodiment and practices in the establishment of *habitus*, dispositions he defines as “embodied history, internalized as a second nature”.²³ He also tackles dichotomies, particularly what Smith identifies as the tension between intellectualism and voluntarism.²⁴

Like McGilchrist, Smith is clear that the way out of dichotomy will not be expressed using philosophical discourse.²⁵ Bourdieu names a “pre-logical logic of

18. McGilchrist, *The Master and his Emissary*, 137.

19. James K. A. Smith, *Awaiting the King: Reforming Public Theology* (Baker Academic, 2017), xiii.

20. Smith, *Desiring the Kingdom*, 25.

21. Smith, *Imagining the Kingdom*, 43–44; c.f. Maurice Merleau-Ponty, *Phenomenology of Perception* (Routledge, 1962), 92. Smith also connects this idea explicitly to McGilchrist’s “right brain” sense of “betweenness” (Smith, *Imagining the Kingdom*, 44).

22. *ibid.*, 43.

23. Pierre Bourdieu, *The Logic of Practice*, trans. Richard Nice (Stanford University Press, 1990), 56.

24. Bourdieu terms these “objectivism” and “subjectivism”, however Smith adjusts the terms for clarity (Smith, *Imagining the Kingdom*, 77).

25. *ibid.*, 76.

practice” in his critique of theoretical reason, and highlights the difference between this concept and a more objective notion of logic “which is inherent in intellectual activity and the intellectual condition, is no doubt what intellectual discourse has least chance of accurately expressing”.²⁶ Nevertheless, a “logic of practice” moves past the intellectualism/voluntarism divide by rejecting both: against the former it asserts that a practitioner’s relationship to practice cannot be reduced to theory, and against the latter it refuses to accord radical autonomy to a “rational” subject in decision-making.²⁷

Indeed, language is a major contributor to the problem of dichotomy. Smith highlights the dualistic and reductionistic character of our lexicon in philosophical anthropology. The likes of Bourdieu and Merleau-Ponty, in attempting to honour “the messy complexity of our being-in-the-world that is *between* all these [linguistic dichotomies]”, struggle to find sufficient language to describe what they mean by a *betweenness*.²⁸ Recognising the insufficiency of language and philosophical arguments to overcome our tendency to think in dichotomous terms, the remainder of this chapter offers some markers of a theological anthropology that builds on Hefner and Tolkien’s understanding of human creativity as a starting point for engaging human technological enhancement.

But first, another dualism relevant to the present analysis bears mentioning. While Tolkien pushes against the imagination-rationality dichotomy to a certain extent in his affirmation of imagination’s truths, he succumbs to a different dichotomy, one that is more subtle and does not concern human nature internally so much as how we understand the world. Technology stands in fundamental opposition to nature in Tolkien’s thought, it is represented as the destroyer of everything natural, beautiful and good. To consider whether there might be middle ground between Hefner and Tolkien’s view of human creating, is essentially to ask whether virtue can be sustained in an increasingly technological world. If

26. Bourdieu, *The Logic of Practice*, 19.

27. Smith, *Imagining the Kingdom*, 79.

28. Thus Bourdieu resorts to the archaic term *habitus*, to be discussed in the next section (*ibid.*, 85).

Tolkien's chief concern about technology was that it eroded virtue, then his vision of sub-creation stands in opposition to technological "progress". If it is possible to maintain (or even enhance) virtue alongside technological development, however, then perhaps Tolkien's vision can be expanded to include our technological future.

We might sum up the difference between Hefner and Tolkien in terms of their understanding of human creativity in relation to divine, a connection established in chapter two of this work. If human creativity/artistry is understood in relation to God as the master craftsman, then Hefner does not give sufficient epistemic worth to the imagination in his understanding of creativity, while Tolkien fails to identify technology as a legitimate exercise of artistry. A sufficient account of theological anthropology will need to correct these imbalances in order to engage human technological enhancement.

6.2 A Vision of Moral Co-Creation

Having explored several resources that assist us in moving beyond the problematic dichotomies identified in existing approaches to co-creation, we may now begin sketching out a new proposal that unites the strengths of its predecessors and overcomes some of their limitations. The difficulty of articulating a sufficient account of the imagination by means of theoretical discourse has already been raised, however in mapping out a model of human creativity (or "co-creation") that might engage human enhancement challenges some of the major contours of the terrain are outlined here.

1. Humans must be understood as products of a creative "evolutionary" process.

This is Hefner's starting point.²⁹ Acknowledging the evolutionary origins of humanity has often required theologians to reconceptualise particular ideas and doctrines, from the *imago Dei* to the nature of the soul and whether or not God knows the future. Anything we might say theologically about human traits must not run

29. At least in his writings, Tolkien did not appear to wrestle with the question of evolution and human origins, and how to accommodate this within a theological understanding of human being.

counter to what we know scientifically about the evolution of *Homo sapiens* and non-human animals (though such theological statements need not be completely explained by scientific observation either).³⁰

Agustín Fuentes connects the imagination to the evolutionary process from which humans arose, arguing that the imagination's deployment in religious experience is an outcome of niche construction.³¹ While many who offer evolutionary explanations for religion employ such explanations to discount the existence of the supernatural, Fuentes provides a more synthetic account. For Fuentes, evolutionary processes may act within a process of revelation, and "the assumption of a supernatural engagement as part of the emergence of the symbolic in the human evolutionary record makes a lot of sense".³²

Fuentes' approach resonates with Hefner's own attempts to understand theological ideas in light of our evolutionary history. Whereas Hefner reaches for earlier sociobiological accounts, somewhat problematic in their ideological commitments, to reconcile a theological understanding of human being with an evolutionary perspective,³³ Fuentes is less concerned to fit a notion of revelation neatly into a natural account.³⁴ This perhaps has more to do with an underlying approach to integrating theological and scientific knowledge, a challenge addressed in some detail in chapter three of this work.

2. Creativity is central to human agency and responsibility.

30. Of course, this is further complicated by problems with how we think scientifically about species demarcation – Jonathan Jong offers a convincing analysis of the fuzzy boundaries and arbitrary centre (with contemporary humans as exemplars) to our understanding of "human" (Jonathan Jong, "What Are Human Beings (That You Are Mindful of Them)? Notes from Neo-Darwinism and Neo-Aristotelianism," in *Issues in Science and Theology: Are We Special?*, ed. Michael Fuller et al. (Springer, 2017)).

31. Agustín Fuentes, *The Creative Spark: How Imagination Made Humans Exceptional* (Dutton Penguin Random House, 2017), 215. Graham Ward more recently has traced the evolutionary origins of the imagination, highlighting the moment when "wandering becomes wondering" as the imagination unfolds from a growing consciousness of the inconceivable (Graham Ward, *Unimaginable: What We Imagine and What We Can't* (I. B. Tauris, 2018), 39–40).

32. Fuentes, *The Creative Spark*, 216.

33. See 4.2.2.

34. Though perhaps this is simply because Fuentes writes of religion more in passing, rather than attempting a project to explicitly reconcile theological and scientific knowledge. Fuentes himself also gives the impression that he has no personal stake in whether the supernatural does indeed exist (Fuentes, *The Creative Spark*, 218).

This is the core thesis of Fuentes' recent work in anthropology *The Creative Spark*.³⁵ We might also return to the notion of the *imago Dei*. Though Hefner and others connect technological development, and co-creation more broadly, with the affirmation that humans are created in the divine image, we might go further and speak particularly of the imagination. "We are makers of images because we are in the image of."³⁶ This brings to mind Coleridge's description of the imagination as an echo in the finite of the infinite "I am".³⁷ Certainly, imagination is fundamental to our experience of human being.

A consideration of creativity and imagination, particularly within the context of human agency and responsibility, needs to be embedded within a sufficient recognition of fallenness. Humans are *not* entirely free, and this is a tension that must underpin reflections on discernment and ethics. Hefner's portrayal of sin as little more than a friction between our biological drives and our more civilised cultural selves is inadequate when it comes to accounting for the noetic limitations of human fallenness.³⁸ While sin is a distinctly theological category, scientific insights from psychology and epigenetics offer a consistent picture of human choice as constrained in various ways by our formative experiences and our biological heritage (going back a number of generations). We therefore need to find an adequate way of talking about responsibility within a context of limitation; moving beyond Hefner's dialectic of freedom and determinism.³⁹

We might therefore ask whether an emphasis on the imagination accords due weight to human fallenness. As Hedley writes, "Whereas much theology of the last century emphasized the gap between humankind and God, the imagination is evidence of a high estimate of human potential."⁴⁰ Is this estimate too high? The present argument for a greater focus on the imagination must be tempered with

35. Fuentes, *The Creative Spark*

36. Ward, *Unbelievable*, 207, emphasis original.

37. Coleridge, *Biographia Literaria*, 167.

38. Hefner does speak of sin in theological terms, and the dangers that our fallenness poses for our co-creative work at a later stage (Hefner, "The Animal that Aspires", 165).

39. Tolkien seems to imply a degree of both freedom and responsibility in his sub-creation, though this is less developed.

40. Hedley, *Living Forms of the Imagination*, 29.

this recognition of an uneasy tension. Acknowledging that the imagination must be subject to the same noetic limitations of sin as other aspects of cognition offers a check against untrammelled enthusiasm for and confidence in the technological futures we might dream up, without discouraging us from exercising creativity to the extent that we are able.⁴¹

The question of freedom and the constraints of sin return us again to certain dichotomies of speech and thought. We cannot help but conceive of freedom and determinism, or responsibility, in dialectical terms. Here, we may recall Bourdieu's "logic of practice" discussed earlier in this chapter as a challenge to the intellectualism/voluntarism divide. Similarly, Bourdieu's conception of *habitus* becomes "a way to break out of false dichotomies between freedom and determinism, intellect and instinct".⁴² Thus Bourdieu is able to summarise the expansiveness of *habitus* as follows:

This infinite yet strictly limited generative capacity is difficult to understand only so long as one remains locked in the usual antinomies – which the concept of the *habitus* aims to transcend – of determinism and freedom, conditioning and creativity, consciousness and the unconscious, or the individual and society. Because the *habitus* is an infinite capacity for generating products – thoughts, perceptions, expressions and actions – whose limits are set by the historically and socially situated conditions of production, the conditioned and conditional freedom it provides is as remote from creation of unpredictable novelty as it is from simple mechanical reproduction of the original conditioning.⁴³

The language here, particularly with respect to freedom and determinism, recalls aspects of Hefner's anthropology. Whereas Hefner tries to assert both the freedom and the determinism that constitutes human being in the world,⁴⁴ attempting to resist dualisms as he does so, his dialectic construction falls short of the goal. Listening to the kind of approach set out by Bourdieu and other phenomenologists might give Hefner the resources he needs to overcome this dualism, without being forced into dichotomous language.

41. A full consideration of the noetic limitations of the imagination is beyond the present scope – and perhaps ultimately unknowable – however this point is raised as a reminder of the fallibility of all aspects of human cognition.

42. Smith, *Imagining the Kingdom*, 85.

43. Bourdieu, *The Logic of Practice*, 55.

44. See 3.1.3.

3. Human creativity is modelled on divine creativity.

Acknowledging the complicating matter of fallenness, the centrality of creativity to theological anthropology is supported by a connection between God's creative work and human making. This work began with the premise that human creativity belongs properly within a doctrine of creation. Hart's treatment of human artistry as a legitimate aspect of creation, as well as the theological works of Sayers and Maritain and insights from the field of creativity studies, laid the foundation for a treatment of technology along the same lines.

Hefner attempts to articulate the derivative character of human creating in his application of the suffix "co" – although the ambiguity of the "created co-creator" construction and its diverse interpretation has already been noted. The relationship of human creating to divine is more clearly stated in Tolkien's sub-creation, as he intuitively feels the presence of divine norms that guide our co-creating.⁴⁵

Ward describes an analogy between divine creation as the "writing" of God (through the Logos) and the act of creation by authors through the use of *logoi*.⁴⁶ Hart locates the meaningfulness of our freedom to create in the fact that it is exercised within given boundaries.⁴⁷ Although human creativity imitates the divine, this does not diminish its creative character – McGilchrist reminds us that imitation requires us to imaginatively inhabit the other.⁴⁸ David Jones speaks to the joyfulness of art in particular as an imitation of divine creating, writing that "there is a sense in which [the] gratuitousness in the operations of the Creator is reflected in the art of the creature".⁴⁹ The value ascribed to the imagination by scientists, poets, artists and theologians alike attest to its importance for creativity generally, and implies the breadth of human activity that may be treated under the rubric of creation. The cross-disciplinary applicability of an understanding of human creativity in

45. This seems implied in the line "we make still by the law in which we're made" from "Mythopoeia".

46. Ward, *Unbelievable*, 204–205.

47. Trevor Hart, "Through the Arts: Hearing, Seeing and Touching the Truth," in *Beholding the Glory: Incarnation Through the Arts*, ed. Jeremy Begbie (Darton, Longman & Todd, 2000), 18.

48. McGilchrist, *The Master and his Emissary*, 249.

49. David Jones, "Art and Sacrament," in *Epoch and Artist: Selected Writings*, ed. Harman Grisewood (Faber & Faber, 1959), 153.

connection with divine creation is treated further in the fifth hallmark of this proposed theological anthropology.⁵⁰

4. Scientific insights are respected and incorporated into an understanding and description of what it means to be human, without reducing theological and philosophical claims to scientific ones.

There is a degree of overlap here with the first marker identified, as a robust treatment of anthropology in the context of humanity's evolutionary beginnings necessitates an engagement with scientific discourse. The relationship of science to theology is an inexhaustible question; a field of research unto its own.

Cognitive science research supporting the role of metaphor and the importance of the imagination for how we make sense of the world is a good example of how science can inform our theological anthropology.⁵¹ Similarly, Hefner's understanding of the genetic similarities among diverse species informs his assertion that humans are embedded within broader natural processes.⁵² Some of the creativity studies literature outlined in chapter two is presented from a scientific outlook, and may also contribute to our theological understanding of how human creativity resembles the creative work of God.⁵³

Nevertheless, in seeking a sufficient model of relating science and theology we must avoid reducing theological ideas to scientific statements. Hefner's approach to the science and religion dialogue is essentially to express theological claims in scientific terms; the evaluation in chapter three concluded that he is not entirely successful at doing so. Additionally, he appears to affirm theological ideas and instincts that do not fit neatly within the constraints of his chosen scientific methodology. Tolkien, on the other hand, shies away from any explicit connection of his ideas on human creativity to scientific knowledge.

The present study instead envisions an approach to theological anthropology that is able to incorporate scientific insights into its construction, yet acknowledges

50. See page 240.

51. See page 261.

52. See page 78.

53. E.g. Chirico et al., "Awe Enhances Creative Thinking".

that certain theological content remains in the domain of faith and relies on special revelation. It is somewhat along the lines of the broader “natural theology” recently drawn out by McGrath, which describes a coherence to the natural world and the science that explores it when understood through the lens of a Christian faith.⁵⁴

5. Technology is considered a legitimate exercise of human co-creativity.

Scott Midson describes the need to develop a “worldly ethic that is not distracted by Eden”.⁵⁵ Romanticised notions of Eden can lead to critique of human-built environments contrasted with the “givenness” of the world not created by humans.⁵⁶ “Where Eden is presented as a utopian part of our past, our nature, there will be understandable aims to return to it.”⁵⁷ Richard Sennett describes the paralysis that produces this type of escapism:

So great are the changes required to alter humankind’s dealings with the physical world that only this sense of self-displacement and estrangement can drive the actual practices of change and reduce our consuming desires; the dream of dwelling in equilibrium and at peace with the world risks, in my view, leading us to seek escape in an idealized Nature, rather than confronting the self-destructive territory we have actually made.⁵⁸

Contemporary philosopher of technology Mark Coeckelbergh helps us to unpack this dichotomy in his own discussion of technology with respect to the Romantic movement, with which Tolkien is somewhat aligned. Technology is often seen as hostile to Romanticism, orienting us away from the natural and the sublime to the mechanical and informational. Coeckelbergh describes the current uses of information and communications technologies as a “surprising marriage of Enlightenment rationalism and Romanticism”.⁵⁹ For Coeckelbergh, the notion that Romanticism is antithetical to technology is the result of a false definition of Romanticism, or perhaps a false assumption embedded within Romanticism

54. McGrath, *Re-Imagining Nature*.

55. Midson, *Cyborg Theology*, 10.

56. Norman Wirzba, *From Nature to Creation: A Christian Vision for Understanding and Loving Our World* (Baker Academic, 2015), 68.

57. Midson, *Cyborg Theology*, 63. Midson highlights Francis Bacon as a prime example of this thinking with his vision of combatting the effects of the Fall through technological means.

58. Richard Sennett, *The Craftsman* (Yale University Press, 2008), 13.

59. Coeckelbergh, *New Romantic Cyborgs*, 3.

itself.⁶⁰ The romantic dialectic is deterministic for both Romantic critiques of technology, and rejections of these critiques. “Romantic thinking is not only nostalgic and against the machine; it also looks forward to a future *with* the machine.”⁶¹ Even those contemporary philosophies of technology that claim to reject the pessimism and Romanticism of earlier critics such as Weber and Heidegger have “uncritically borrowed the same dichotomy” between Romanticism and technology, contends Coeckelbergh.⁶² McGilchrist disagrees with Coeckelbergh here, however, instead construing Romanticism as attempting to transcend dichotomies rather than perpetuate them – he describes the Romantic goal using his brain structure metaphor as the “reintegration of the left hemisphere’s realm into that of the right”.⁶³

Coeckelbergh lays significant blame at the feet of Romanticism: it has “given us the conceptual tools to create a gap between science and religion, between technology and spontaneity, between machines and humanity”.⁶⁴ At the same time, however, Romanticism was a shaping influence in nineteenth century science and technology, animating desire to discover more of “mysterious Nature”.⁶⁵ Technology became the instrument of Romanticism.⁶⁶ John Tresch also identifies certain historical strands of Romanticism that “were compatible with an embrace – an ambivalent, cautious embrace – of science and technology”.⁶⁷ Some have described science fiction in this vein of Romanticism embracing technology – for instance, Fred Botting labels Gibson’s *Neuromancer* as a “Gothic romance”, highlighting its dark settings, its preoccupation with death, and its confusion as to the borders of the self.⁶⁸ Coeckelbergh’s critique of Romanticism appears a little overblown on balance – while some aspects of the movement do set technology in opposition to nature,

60. *ibid.*, 11.

61. *ibid.*, 13, emphasis original.

62. *ibid.*, 71.

63. McGilchrist, *The Master and his Emissary*, 351.

64. Coeckelbergh, *New Romantic Cyborgs*, 74.

65. *ibid.*, 98–99.

66. *ibid.*, 101. See also John Tresch, *The Romantic Machine: Utopian Science and Technology after Napoleon* (University of Chicago Press, 2012).

67. *ibid.*, 311.

68. Fred Botting, “Virtual Romanticism,” in *Romanticism and Postmodernism*, ed. Edward Larrissy (Cambridge University Press, 1999), 110–112.

humanity and virtue, there is overall a degree of ambiguity when it comes to the advantages and disadvantages of technological development.

All of this suggests that one aspect of Tolkien's approach to human creating at least, the centrality of the imagination, need not stand in opposition to technological development. Coeckelbergh asks whether techno-romanticism can be redeemed today, and identifies a number of "conceptual building blocks" that Romanticism offers in spite of its shortcomings. These include a protection of space for reflection and contemplation, an acknowledgement that we are not in control of our own destiny, a more complicated view of the self and of reality, and the refusal to set political action in dichotomy with utopian dreams.⁶⁹ McGilchrist, too, finds much of value in Romantic thought, viewing it as the right hemisphere's way of looking at the world reasserting its rightful dominance over the left.⁷⁰ Coeckelbergh's own answer, however, is not to redeem a particularly Romantic approach to thinking about technology, but rather to move beyond the Romantic thought model and its dualisms.⁷¹ He proposes a focus on skilled engagement, craftsmanship and narrative to escape the technology-human binary (which he identifies as Romantic) and birth the "non machine."⁷² Coeckelbergh concedes that he cannot clearly envision a narrative that escapes this binary yet, but believes it to be possible if we bring a collective imagination to the task.⁷³ Coeckelbergh leaves us with a critique of dualistic thinking and a desire to escape binaries, but little in the way of constructive proposals for how to do so.

One way forward might be to re-examine the relationship between technology and virtue. Is the exercise of technology even compatible with virtue? Lewis expresses a strong negative, drawing a contrast between the pre-technological and technological mindsets.

69. Coeckelbergh, *New Romantic Cyborgs*, 250.

70. McGilchrist, *The Master and his Emissary*, 354.

71. Coeckelbergh, *New Romantic Cyborgs*, 252.

72. *ibid.*, 274–275. At the same time, Coeckelbergh acknowledges the difficulty of avoiding romantic meanings, only in part a problem of language (*ibid.*, 275).

73. *ibid.*, 278.

There is something which unites magic and applied science while separating both from the ‘wisdom’ of earlier ages. For the wise men of old the cardinal problem had been how to conform the soul to reality, and the solution had been knowledge, self-discipline, and virtue. For magic and applied science alike the problem is how to subdue reality to the wishes of men: the solution is a technique; and both, in the practice of this technique, are ready to do things hitherto regarded as disgusting and impious.⁷⁴

Ellul identifies a key feature of a society governed absolutely by technique as the inability to consider technology in light of the ends that it serves, focusing instead on performance.⁷⁵ These characterisations certainly are not promising for a moral technological future.

Can we tell a story in which technology is not a threat to virtue? James K. A. Smith points out that it is not as simple as re-writing the story of existing technologies. While the intent of the user matters to a certain degree, Smith contends that “cultural phenomena and systems can be laden with an implicit vision of the good life that is inscribed in [their] very structure”.⁷⁶ Therefore it is not only the social imaginary of the users and decision-makers that requires attention, but that of the technology *makers*.⁷⁷ This shift must occur at a level beyond the discerning individual. We must consider how imaginations are recruited, which stories are compelling when it comes to the possibilities for enhancing humans with technology.

In exploring Brent Water’s critique of posthumanism, Midson suggests that technology and nature are dichotomised in terms of sinfulness and Edenic innocence, respectively.⁷⁸ Possibly we can see Tolkien’s views on technology in a similar light, and draw further connections to the influence of Romanticism on his thought. Hefner, on the other hand, rejects the fall “except in a decisively figurative manner, since we cannot accept that humans ever existed in a prior state of perfection”,⁷⁹ and this

74. C. S. Lewis, *Perelandra* (Simon & Schuster, 1996), 83–84. Note that “applied science” is Lewis’ term for technology.

75. Jacques Ellul, *The Technological Society*, trans. John Wilkinson (Knopf, 1964), 302.

76. Smith, *Imagining the Kingdom*, 144.

77. Hannah Arendt shows how engineers and technologists necessarily receive guidance from politics, speaking of the “political integration of technical power” (Hannah Arendt, “The Threat of Conformism,” in *Essays in Understanding, 1930-1954: Formation, Exile, and Totalitarianism*, ed. Jerome Kohn (Schocken Books, 2005), 427).

78. Midson, *Cyborg Theology*, 171.

79. Hefner, *THF*, 274.

may factor into his more open stance toward technology. Perhaps an “alternative articulation of Eden in terms of non-innocence” might be a way through the difficulties that both Edenic paradise and alternative utopian origin myths produce,⁸⁰ and would additionally be more compatible with an evolutionary account of origins.

Another dichotomy that ought to be addressed is the tendency to see τέχνη and art as antithetical. In the same way that Tolkien sets virtue and technology in opposition, he also makes a clear distinction between art and technology. He did not see any synthesis between what he understood as two very distinct creative impulses, with entirely separate ends. He explains how the two diverge, represented in his narrative by the “magic” of the Elves.

[Elf] magic is Art, delivered from its many human limitations: more effortless, more quick, more complete (product, and vision in unflawed correspondence). And its object is Art not Power, sub-creation not domination and tyrannous re-forming of Creation.”⁸¹

Indeed, with all the limitations of human fallenness, even what Tolkien designates as “Art” can slide into all of the perils of a technological outlook.

This desire [to create Art] is at once wedded to a passionate love of the real primary world, and hence filled with the sense of mortality, and yet unsatisfied by it. It has various opportunities of ‘Fall’. It may become possessive, clinging to the things made as ‘its own’, the sub-creator wishes to be the Lord and God of his private creation. He will rebel against the laws of the Creator – especially against mortality. Both of these (alone or together) will lead to the desire for Power, for making the will more quickly effective, – and so to the Machine (or Magic).⁸²

But what if it were possible for the devices and processes that we currently think of as technology to be brought closer to Tolkien’s conception of Art? It is not so easy as resolving to create technology for good ends, however. Tolkien’s very definition of technology (or magic, as he closely equates the two) suggests an inevitable corruptibility. The “evil” of domination Tolkien describes very often grows out of good intentions to benefit the world,⁸³ a point Tolkien illustrates in

80. Midson, *Cyborg Theology*, 173.

81. *Letters*, 146.

82. *Letters*, 145.

83. *Letters*, 146.

the reasons behind Gandalf, Elrond and Galadriel all refusing to take the Ring. Hart summarises the role of art as he understands it in Tolkien's thought:

artistic making, therefore, departs freely, properly, and often from the constraints of whatever appears to be given in the world; but when it does so its end is never selfish, always being rooted in a delight in the world for its own sake and desiring nothing more than the world's own good, its enhancement, and the fulfilment of possibilities latent within it.⁸⁴

Yet, as Hart describes art as participation in God's creativity,⁸⁵ might we not think of technology in the same way? Heidegger, as highlighted in the previous chapter, called for a greater incorporation of poetic vision into the modern technological orientation toward the world.⁸⁶ Richard Sennett develops a related thesis in his work, arguing that technology and technical understanding should be understood in the vein of a skilled craft, beginning as a bodily practice and developing through the power of the imagination.⁸⁷ This aligns with Hart's analysis of how our understanding of art has shifted over time, moving further away from the "craftmanship" notion of operating within a divinely ordered "workshop" to the idea that artists, by their own ingenuity, are themselves responsible for ordering chaos.⁸⁸

In a critique of Bronislaw Szerszynski's *Nature, Technology, and the Sacred*, Michael DeLashmutt laments the omission of "any reference to the significant power of both myth and imagination in the postmodern sacred world", arguing that reflections of technology would be enriched by attending to such neglect.⁸⁹ Bohm, too, identifies a similar deficiency when exploring technology from a creativity studies perspective, arguing that "fundamentally, the wrong order of human action that is responsible for our basic difficulties is due to the fact that we tend to be mechanical when what is called for is creativity."⁹⁰ Mary Midgley calls for a

84. Hart, "Tolkien, Creation, and Creativity", 52.

85. Hart, "Through the Arts", 16.

86. Heidegger, "The Question Concerning Technology", 34–35.

87. Sennett, *The Craftsman*.

88. Hart, *Making Good*, 197. Certainly, Tolkien's own understanding of art aligns more with the early notion, rather than its more audacious development.

89. Michael DeLashmutt, "The Technological Imaginary: Bringing Myth and Imagination into Dialogue with Bronislaw Szerszynski's *Natures, Technology and the Sacred*," *Zygon* 41, no. 4 (2006), 804.

90. Bohm, *On Creativity*, 19.

reintegration of the vision of artists and philosophers with that of scientists.⁹¹ They come together, she argues, via a greater use of the imagination.

We need to compare those visions, to articulate them more clearly, to be aware of changes in them, to think them through so as to see what they commit us to. This is not itself scientific business, though of course scientists need to engage in it. It is necessarily philosophic business (whoever does it) because it involves analysing concepts and attending to the wider structures in which those concepts get their meaning. It starts with the fuller articulation of imaginative visions and moves on later to all kinds of more detailed thought, including scientific thought.⁹²

This kind of attention to the visions of the world that we construct will also improve our capacity to discern how we ought to act. “A clearer, more realistic imaginative vision of the world is bound to make for a clearer sense of priorities.”⁹³ This connection between imagination and morality will be explored further in the next section.

Ellul describes art in technological society as “at once the positive reflection of the freedom conferred by technology and a compensation for the fatality of technological growth”.⁹⁴ Yet the many qualities of art surely spring from more than just a technology-enabled freedom. In a more integrated approach described by Midgley, art may be allowed to critique technology (without setting the two in complete opposition). Van der Laan raises the “inherent contradiction of technofix answers for a technologically caused ecological degradation”.⁹⁵ An awareness of the shortcomings of technology, and possible mitigations, is unlikely to come from technologists alone. Bieber Lake offers an analysis of Margaret Atwood’s *Oryx and Crake*, demonstrating how it satirises a society in which the arts are eclipsed and language is diminished by the dominance of technique.⁹⁶ In *Zen and the Art of Motorcycle Maintenance*, Robert Pirsig calls for a “real unification of art and technology”.⁹⁷ In an article

91. Midgley, *Science and Poetry*, 38.

92. *ibid.*, 36.

93. *ibid.*, 205.

94. Jacques Ellul, “Remarks on Technology and Art,” *Bulletin of Science, Technology & Society* 21 (2001), 36.

95. Laan, “Editor’s Notes”, 238.

96. Lake, *Prophets of the Posthuman*, 118–119; c.f. Margaret Atwood, *Oryx and Crake: A Novel* (Random House, 2003).

97. Robert Pirsig, *Zen and the Art of Motorcycle Maintenance: An Inquiry into Values* (HarperTorch, 1974), 377.

decrying the decline and devaluing of the humanities in the university, author Marilynne Robinson points out that both the Massachusetts Institute of Technology and Rensselaer Polytechnic Institute invest substantially in the arts. “These schools might know something about nurturing the technical mind.”⁹⁸

In some respects, science fiction is the perfect bridge between τέχνη and art as they are presently conceived. Le Guin describes proper science fiction as “ethically responsible art” — it brims with potential for “playing games with and making sense and beauty out of our fearfully enlarged world of knowledge and perception”.⁹⁹ In a similar vein, Bohm reminds us that the artist (or in this case, the fiction writer), can learn a lot from scientists in terms of coherency – artistic beauty and scientific truth are “inseparable” and thus scientific insights may guide the use of the imagination in fiction.¹⁰⁰ Bohm’s notion of “fittingness” as applicable to the whole of life means that we “have to be both creative artists and skilled artisans”, and this extends into the moral realm.¹⁰¹

Hefner’s entire created co-creator construction is premised on the idea that technology is intrinsic to human being (he extends the category of technology to include transhumanist impulses).¹⁰² Recognising that humans have always engaged with technology in some form, that it is instrumental in the way that we have related to our environment, reorients the discourse. Technology ceases to be a monolithic entity that represents the antithesis of all that is natural and good. Brian Brock offers further resources for how to orient ourselves theologically to technology’s ubiquity. Rather than eschew technology generally (or perhaps even enhancement technologies specifically) as necessarily representing a threat to the created order, Christians must familiarise themselves with the decision-making processes currently surrounding technology.¹⁰³ A closer reflection on technological artifacts reveals the

98. Marilynne Robinson, “What Are We Doing Here?,” in *What Are We Doing Here?: Essays* (Virago, 2018), 29.

99. Ursula Le Guin, “Escape Routes,” in *The Language of the Night: Essays on Fantasy and Science Fiction*, ed. Susan Wood (Putnam, 1979), 206.

100. **bohm_2004a**, 46.

101. **bohm_2004a**, 1–6.

102. Philip Hefner, “The Evolutionary Epic,” *Zygon* 44, no. 1 (2009), 163.

103. Brian Brock, *Christian Ethics in a Technological Age* (Eerdmans Publishing Co., 2010), 3.

collective judgement of a society on what is meaningful, argues Brock, thus offers resources to both understand and critique broader social views.¹⁰⁴ Though Brock denounces what he considers to have been moral theology's "embrace" of prevailing methods of technology assessment as "an unwarranted capitulation to the spirit of the age", he nevertheless argues for a middle path between wholesale rejection of technology and the uncritical adoption of the "progress" narrative.¹⁰⁵ He "aim(s) to locate modern technology within the dynamics of sin as self-assertion against God and good works as service, so offering Christian theology better purchase on the landscape within which all human action is set in a technological age."¹⁰⁶

By using the language of sin in his situating of technology, and our decision-making surrounding technology, Brock leaves room for enhancement technologies to be approached like any other ethical challenge. They are not categorically different from other technologies, in that they can be employed either for good or evil purposes. While theology is tasked with "desacralising" technology, questioning the power it reinforces, whether it embodies love, and how it impacts our relationships with one another and with the rest of creation,¹⁰⁷ it is with the help of other resources explored here (imagination and story) that these tasks are undertaken.

6. Humans are recognised as story tellers and myth makers at their core, with narrative central to the way in which we understand the world.

Again, this is a conclusion that is supported by findings in cognitive science. Not only do many metaphors appear to be universal across cultures, and constitutive of how we conceptualise the world, rather than merely operative at the level of language,¹⁰⁸ but myths are ubiquitous in human societies. Our ideas of what is good are inscribed in us by stories, or storied practices such as liturgy.

Here, the calls of Hefner and Cole-Turner for more stories and liturgies that can shape our reflection on human enhancement questions (though their philosophy of

104. Brock, *Christian Ethics in a Technological Age*, 11.

105. *ibid.*, 20, 191.

106. *ibid.*, 191.

107. *ibid.*, 225–235.

108. George Lakoff and Mark Johnson, *Metaphors We Live By* (University of Chicago Press, 2003).

the imagination is not sufficiently developed to follow through on these claims) are justified and strengthened. A narrative approach to the task of theology and ethical reflection is recognised as most resonant with the way that we naturally make sense of our world, supporting the conclusions made in this work surrounding the moral imagination.

Given literature's crucial role in moral reasoning, how might it engage with the specific moral challenges raised by human enhancements? Farah Mendlesohn contends that "in a genre predicated on the thought experiment, theological discourse comes naturally".¹⁰⁹ If science fiction is such a focal point in "non-fiction" futurist literature, then it makes sense to use it in our theological reflection on the same questions. The directing of the imagination towards questions of future human being, and of technological possibilities, not only shapes popular hopes and expectations, but might also help with discernment. The medium of fiction allows us to probe our own values – in science fiction it can serve to expose the metaphysical commitments of technologists who may otherwise claim a neutral or objective position for their research. Burdett summarises the value of science fiction as a corrective to transhumanist philosophies, because "it is unabashed about the mythic status of its narratives and the inherent religious undertones it seeks to explore".¹¹⁰

Fiction may therefore provide a helpful medium for expressing these theological reflections on human enhancement. Given how vital the imagination is for transhumanist visions of the future, a greater focus on imagination might also equip and expand current theological responses to the challenges of human enhancement. Exploring the imaginative capacity of humans suggests that we *should* apply our creativity and ingenuity to improve human nature if possible, though we need to think carefully about limits and discernment. At the very least, a theological response to human enhancement that engages the imagination will go further in the public sphere than outlining a set of theological propositions and doctrines

109. Farah Mendlesohn, "Religion and Science Fiction," in *The Cambridge Companion to Science Fiction*, ed. Edward James (Cambridge University Press, 2003), 274–275. Ricoeur makes this point concerning literature more generally (Paul Ricoeur, *Oneself as Another* (University of Chicago Press, 1992), 148).

110. Burdett, *Eschatology and the Technological Future*, 69.

which many do not affirm. How might science fiction be a resource for theological discourse with respect to human enhancement and the human future?

Fiction is much more forgiving when it comes to the complexities surrounding the human enhancement debate, it can tease out some of the advantages and disadvantages of particular technologies yet resists the urge to provide an ethical “checklist” against which each new technology ought to be evaluated. Take one of the wilder speculations of transhumanists that envisions the uploading of our minds to a digital substrate, trading our dependence on frail, degenerating “meat” bodies for the immortality of software existence. Theologically, there are lots of things we might want to say about this. Theologians have highlighted embodiment as essential to human being, and finitude and mortality as key aspects of creaturehood. But how much traction can these arguments establish with those who do not accept the associated theological worldview, and who are captivated with the possibilities of the uploaded mind portrayed so positively by techno-utopians?

Perhaps we might direct people to Charles Stross’ excellent novel *Glasshouse*.¹¹¹ Stross imagines a post-Singularity existence in which everyone exists as an uploaded mind, and highlights the dangers of censorship, memory preservation and identity theft. Large swaths of history have been expunged, vulnerable to viruses developed with malevolent intent. The freedom of morphological and psychological expression and identity (and the ability to change these at will) is represented as a vast improvement over the constrained sexual relationships of the past (especially as biological reproduction is no longer relevant), yet a controlled experiment attempting to recover knowledge of twentieth century social practices ultimately challenges some of these assumptions. Stross is able to simultaneously critique present social realities and imagined future ideals.

Or we might consider the recent work *Lock In*, by John Scalzi,¹¹² in which neural network implants and virtual reality technologies are used to enhance the quality of life and freedom of individuals suffering from total paralysis in their physical bodies. They are able to control robotic personal transport units, and can

111. Charles Stross, *Glasshouse* (Orbit Books, 2007).

112. John Scalzi, *Lock In* (Gollancz, 2015).

therefore pursue “normal” activities in their daily lives. These imaginings open up a possibility for such technologies that theologians may not have considered: where medicine may continue to fail in healing paralysis, other technologies may step in to restore a fuller experience of human flourishing that could otherwise be denied to particular individuals. Of course, the difficulty of distinguishing enhancement from therapy comes into play here, but fictional explorations assist our theological reflection on such technologies.

7. The formation of the moral imagination is given due accord, including the diversity of stories which shape our moral imaginary.

The imagination has taken central place in our reflection on epistemology, and on the co-creative aspect of human action. McGilchrist identifies the work of the imagination as crucial to breaking out of the left hemisphere’s deadening view of the world and restoring balance, according to his metaphor of hemispheric struggle.¹¹³ As the imagination cannot be properly exercised apart from the moral life, so, Percy Bysshe Shelley contends, is the imagination “the great instrument of moral good”.¹¹⁴ He blames “the cultivation of the mechanical arts in a degree disproportioned to the presence of the creative faculty” for the contemporary inequalities and abuses he observed.¹¹⁵

Philosopher Mark Johnson has highlighted the importance of the imagination in our ethical decision-making.

We human beings are imaginative creatures, from our most mundane, automatic acts of perception all the way up to our most abstract conceptualization and reasoning. Consequently, our moral understanding depends in large measure on various structures of imagination, such as images, image schemas, metaphors, narratives, and so forth. Moral reasoning is thus basically an imaginative activity, because it uses imaginatively structured concepts and requires imagination to discern what is morally relevant in situations, to understand empathetically how others experience things, and to envision the full range of possibilities open to us in a particular case.¹¹⁶

113. McGilchrist, *The Master and his Emissary*, 374.

114. Shelley, “A Defense of Poetry”, 202.

115. *ibid.*, 205.

116. Johnson, *Moral Imagination*, ix-x.

Ricoeur identifies the imagination as crucial for social action, for challenging the status quo.¹¹⁷ Iris Murdoch places it at the centre of our moral vision, writing that “I can only choose within the world I can see, in the moral sense of ‘see’ which implies that clear vision is a result of moral imagination and moral effort.”¹¹⁸ In attempting to articulate a framework that describes the imaginative dimensions of moral experience, Johnson argues that it is necessary to discard traditional conceptual dichotomies (those between intellect and feeling, imagination and reason, mind and body).¹¹⁹ As he proceeds, he suggests that what we know of the imagination and its role in reasoning is inconsistent with certain aspects of a culturally inherited view of morality.¹²⁰

To begin with, an affirmation of humans as fundamentally imaginative refutes any received views of morality that would seek out universal moral principles in an absolutist fashion. Such approaches depend on views of reasoning and conceptionalisation that have been demonstrated to be false by various developments in the cognitive sciences.¹²¹ Moral absolutism and moral relativism are both rejected for misconstruing the relationship between reason and imagination (regarding the latter as entirely subjective and unconstrained).¹²² Johnson also challenges notions of moral objectivity as only secured through universal laws.¹²³ Instead, “a new view is emerging of concepts as grounded in structures of our bodily interaction and as irreducibly imaginative in character”, undermining the assumptions of traditional moral law theories which depend on a mind/body dualistic understanding of human

117. Paul Ricoeur, “Imagination in Discourse and in Action,” in *The Human Being in Action: The Irreducible Element in Man Part II Investigations at the Intersection of Philosophy and Psychiatry*, ed. Anna-Teresa Tymieniecka (Springer, 1978).

118. Iris Murdoch, “Vision and Choice in Morality,” *Proceedings of the Aristotelian Society* Supplementary Volume 30 (1956), 36–37.

119. Johnson, *Moral Imagination*, x.

120. *ibid.*, x. Of course, this is not to suggest that the link between imagination and morality is a novel one. Interpreting the work of Mark Akenside, Engell describes “the power of the imagination as the hinge connecting experience and perception with moral judgment”. Disordered imagination “becomes the primary source of evil”, whereas “when guided properly, [the imagination] gives a sense of the cosmos as created by God and existing in harmony with man” (Engell, *The Creative Imagination*, 42).

121. Johnson, *Moral Imagination*, 1.

122. *ibid.*, 3.

123. *ibid.*, 218.

nature.¹²⁴ Johnson problematises a moral law approach by demonstrating how its foundational concepts are metaphorically defined, which in turn can only be understood in embodied ways.¹²⁵

The outcome of Johnson's analysis is a call for revisioning traditional conceptions of ethics, and the proffering of a constructive alternative, though he acknowledges that much of the revisioning of an imaginative morality remains to be accomplished.¹²⁶ An attentiveness to the moral imagination, however, gives us insight into the way that prototype concepts operate in our moral deliberation, the kinds of frames we apply to situations, and the underlying metaphors that are definitive to our basic moral concepts and values.¹²⁷ We might probe the possibility of changing certain metaphors, and what this might do to our moral reasoning.¹²⁸ We can explore with empathy the experiences of others.¹²⁹ This level of reflection will at least promote a humility when it comes to our own moral claims, and a recognition that there can be a variety of moral options.¹³⁰ Johnson argues for a firmer imperative, however:

We must cultivate moral imagination by sharpening our powers of discrimination, exercising our capacity for envisioning new possibilities, and imaginatively tracing out the implications of our metaphors, prototypes and narratives.¹³¹

Similarly, McGilchrist identifies art and religion as possible means for escaping the “hall of mirrors” of the left hemisphere, allowing the right hemisphere to “make a comeback”.¹³²

When it comes to the use of the imagination in morality, Johnson argues for a notion of “human objectivity” that can assess competing moral philosophies

124. *ibid.*, 6.

125. *ibid.*, 42. Johnson gives many examples in support of this claim. In one chapter, he focuses on Kantian rationalist ethics, and highlights the point also made by Hilary Putnam that Kant does not simply provide moral rules, but also a moral *image* of the world (*ibid.*, 65; c.f. Hilary Putnam, *The Many Faces of Realism* (Open Court, 1987), 51).

126. Johnson, *Moral Imagination*, xi.

127. *ibid.*, 189–194.

128. *ibid.*, 194.

129. *ibid.*, 242.

130. *ibid.*, 195.

131. *ibid.*, 198. The importance of narrative will be examined more closely later in this chapter.

132. McGilchrist, *The Master and his Emissary*, 388.

according to shared dimensions of human life (biological, cognitive, social, and ecological) without purporting to achieve a “God’s-eye-view” form of objectivity.¹³³ Steven Winter offers a similar account of “transperspectivity”, in which the imagination allows us to perceive our own constructions of the world and consider alternatives.¹³⁴ Lakoff and Johnson argue furthermore that “we are not free to think just anything”, rather learned conceptual systems become instantiated in our brains neurally and thus guide even our imagination.¹³⁵

Despite the work of these champions of the imagination, James K. A. Smith contends that we mainly operate with flawed models of Christian formation that focus on “convincing the intellect rather than recruiting the imagination”.¹³⁶ This echoes Johnson’s warning that we need to move away from formulating moral laws in favour of cultivating the moral imagination.¹³⁷ Thinking about how we might recruit the imagination (of both Christians and the broader public) to moral reflection on human enhancement will surely enrich any understanding of co-creation in this domain.

Literature plays a major role in the shaping of the moral imagination. In his consideration of imaginative apologetics, Andrew Davison draws attention to the dearth of contemporary fiction engaging in apologetics through appeal to the imagination.¹³⁸ Perhaps one answer to the questions raised here is simply to produce more works of fiction that engage the challenges posed by human enhancement imaginatively.

In thinking through the impact of narrative generally and literature more particularly on our moral reflection, we are prompted to ask: *which* stories are shaping our beliefs and our moral imagination? For it is very easy for beliefs to

133. Johnson, *Moral Imagination*, 240.

134. Steven Winter, “*Bull Durham* and the Uses of Theory,” *Stanford Law Review* 42 (1990), 685–686.

135. George Lakoff and Mark Johnson, *Philosophy in the Flesh: The Embodied Mind and its Challenge to Western Thought* (Basic Books, 2003), 4–5.

136. Smith, *Imagining the Kingdom*, 39.

137. Johnson, *Moral Imagination*, xii.

138. Andrew Davison, ed., *Imaginative Apologetics: Theology, Philosophy and the Catholic Tradition* (SCM Press, 2011), 59. This comment comes in the introduction to Ward’s essay “The Good Serves the Better and Both the Best: C. S. Lewis on Imagination and Reason in Apologetics.”

become habits of mind to the extent that we view them as truths, as Ward points out with respect to ideas of ethnicity and gender.¹³⁹ It is important not to overlook those stories that do not align with the dominant narratives of our broader cultural context.

A major critique of current human enhancement proposals is that they are only likely to increase existing inequalities.¹⁴⁰ Much is at stake in determining the ideals toward which humans ought to be enhanced: what should a human become? The potential for inequality can be challenged if a diversity of stories are actively sought and incorporated into a social imaginary in which the human future is reflected upon.

Some of these stories might involve a retelling of history, drawing attention to alternative accounts. Edward Said's *Orientalism*, for example, has led the field of postcolonial studies, and in particular has challenged Western cultural representations of the Orient.¹⁴¹ Kwok Pui-lan offers a postcolonial feminist theology, sketching a vision of theological practice that foregrounds gender and sexuality in a transnational approach.¹⁴² She points out that postcolonial critics often resist construing the world in dichotomous terms, thus giving another reason for listening to non-Western accounts that hold myth and reason together without difficulty.¹⁴³ An analysis of the theological symbols operative in the colonial period, and their reappropriation in postcolonial discourse, offers new perspectives for a global theology.¹⁴⁴ The gospel has always accommodated the culture it inhabits in some way, and non-Western cultures represent additional dialogue partners as theology continues to find renewed expression in every age.¹⁴⁵ Thus, Pui-lan outlines the goal of postcolonial critiques to offer "a reading strategy and discursive practice that seek to unmask colonial epistemological frameworks, unravel Eurocentric logics, and interrogate stereotypical cultural representations".¹⁴⁶

139. Ward, *Unbelievable*, 113.

140. Tom Shakespeare, in foreword to Eilers, Grüber, and Rehmann-Sutter, *The Human Enhancement Debate and Disability*, xii.

141. Edward Said, *Orientalism* (Vintage, 1979).

142. Kwok Pui-lan, *Postcolonial Imagination and Feminist Theology* (SCM Press, 2005).

143. *ibid.*, 73.

144. *ibid.*, 144.

145. *ibid.*, 161.

146. *ibid.*, 2.

In contrast to transhumanist arguments that justice requires the enhancement of human capabilities,¹⁴⁷ disability studies aims to expose the misconstruing of disabled bodies. Tobin Siebers describes the field:

Disability studies does not treat disease or disability, hoping to cure or avoid them; it studies the social meanings, symbols, and stigmas attached to disability identity and asks how they relate to enforced systems of exclusion and oppression, attacking the widespread belief that having an able body and mind determines whether one is a quality human being.¹⁴⁸

Siebers further argues that disability “often comes to stand for the precariousness of the human condition, for the fact that individual human beings are susceptible to change, decline over time, and die”.¹⁴⁹ This is entirely opposed to the transhumanist endeavour, and thus disability accounts are an important check to particular visions of the technological future. While some within the disability community welcome “enhancement”, others see it as a misguided solution.¹⁵⁰ Many with firsthand experience of particular conditions that would be targeted for eradication with biotechnology attest to the value of the “impairments”, arguing that human experience overall would be diminished without these atypical experiences. Dan Goodley and Katherine Runswick-Cole call out the way in which many “disabled” people have not been permitted to occupy the position of the “modern human subject”.¹⁵¹ In addition to challenging certain ideals of enhancement, disability studies offers bioethics a more concrete engagement with varied embodiment, rather than relying only on abstract thought.¹⁵²

Other stories that ought to be listened to are fictional. The short story collection *Outlaw Bodies* explores from a number of perspectives the ways in which future bodies

147. Julian Savulescu, “Justice, Fairness, and Enhancement,” *Annals of the New York Academy of Sciences*, 2006, ; James Hughes, *Citizen Cyborg: Why Democratic Societies Must Respond to the Redesigned Human of the Future* (Westview Press, 2004).

148. Tobin Siebers, *Disability Theory* (University of Michigan Press, 2008), 3–4.

149. *ibid.*, 5.

150. Shakespeare, in Eilers, Grüber, and Rehmann-Sutter, *The Human Enhancement Debate and Disability*, ix.

151. Dan Goodley and Katherine Runswick-Cole, “Becoming Dishuman: Thinking About the Human Through Dis/ability,” *Discourse: Studies in the Cultural Politics of Education* 37, no. 1 (2016), 3.

152. Miriam Eilers, Katrin Grüber, and Christoph Rehmann-Sutter, “Refocusing the Enhancement Debate,” in *The Human Enhancement Debate and Disability: New Bodies for a Better Life*, ed. Miriam Eilers, Katrin Grüber, and Christoph Rehmann-Sutter (Palgrave Macmillan, 2014), 15.

might be controlled through enhancements and modifications, and implications for gender and sexual identity, and disability.¹⁵³ Kathryn Allan has edited a volume of essays that explore disability in science fiction, challenging the dominant presentation of technology as cure.¹⁵⁴ Ato Quayson focuses on the various frames applied to disability in Nobel prize winning literature, arguing that literature helps to “refract these multivalent attitudes towards disability”.¹⁵⁵

Afrofuturism is a movement that blends science fiction with African culture. “Can a community whose past has been deliberately rubbed out, and whose energies have subsequently been consumed by the search for legible traces of its history, imagine possible futures?”, asks major proponent Mark Dery.¹⁵⁶ Ytasha Womack shows that the answer is a resounding “yes”, giving a clear introduction to Afrofuturist thought that reimagines the technological future through a black cultural lens.¹⁵⁷

In terms of a broader theological anthropology, Thweatt-Bates highlights the connections between the “hybridity” of the cyborg and aspects of hybridity in feminist, disability, postcolonial, and queer theologies.¹⁵⁸ Narratives of disability and bodily suffering challenge normative ideas of the human body. The way in which ideal “types” of the human are encoded in the technologies we develop must be examined critically.¹⁵⁹ To do this critique justice requires much more space than we have here, however the necessity of listening to diverse stories requires more than just lip service in reflecting on questions of human enhancement. Hart describes how “the capacity to picture and to speak of the world otherwise than

153. Lori Selke and Djibril al-Ayad, eds., *Outlaw Bodies: A Speculative Fiction Anthology* (Futurefire.net Publishing, 2012).

154. Kathryn Allan, ed., *Disability in Science Fiction: Representations of Technology as Cure* (Palgrave Macmillan, 2013).

155. Ato Quayson, *Aesthetic Nervousness: Disability and the Crisis of Representation* (Columbia University Press, 2007), 36.

156. Mark Dery, “Black to the Future: Interviews with Samuel R. Delany, Greg Tate, and Tricia Rose,” *The South Atlantic Quarterly* 92, no. 4 (1993). Dery first coined the term “afrofuturism”.

157. Ytasha Womack, *Afrofuturism: The World of Black Sci-Fi and Fantasy Culture* (Chicago Review Press, 2013).

158. Thweatt-Bates, *Cyborg Selves*, 142.

159. Midson, *Cyborg Theology*, 193.

in accordance with the currently favoured social construct is itself a capacity to change reality”, and this is the task before us.¹⁶⁰

The concept of moral imagination and the more particular roles of narrative and literature described here connect in important ways to the notion of social imaginaries. Although we have arrived at similar ideas through the alternative routes of metaphor studies and phenomenology, the structure of the social imaginary has silently scaffolded much of these reflections and is worth briefly articulating at this juncture. The social imaginary was first described in full by social theorist Cornelius Castoriadis with his publication of *L'institution imaginaire de la société* in 1975.¹⁶¹ Castoriadis wrote of a creative force from which novelty emerges as a rupture in history; the instituting society forming worlds and bestowing meaning on them.¹⁶² The “imaginary” is the “originary structuring component” which orients institutional systems and determines what is important for a society.¹⁶³ Symbol, myth and legend are the media by which social imaginaries are created.¹⁶⁴

Dilip Parameshwar Gaonkar, in reference to Charles Taylor’s use of the social imaginary, provides a helpful description:

the way a given people imagine their collective social life. Within the folds of a social imaginary, we see ourselves as agents who traverse a social space and inhabit a temporal horizon, entertain certain beliefs and norms, engage in and make sense of our practices in terms of purpose, timing, and appropriateness, and exist among other agents.¹⁶⁵

160. Hart, “The Glory of Imagination”, 233. Here, Hart engages the utopian imagination explored in George Steiner, *After Babel: Aspects of Language and Translation* (Oxford University Press, 1998).

161. . Of course, the term “imaginary” is not original to Castoriadis (though he applies it in novel ways), and we may find it in both Sartre’s *L’Imaginaire: Psychologie phénoménologique de l’imagination* (1940) and Lacan’s *Le séminaire. Livre XI. Les quatre concepts fondamentaux de la psychanalyse* (1973). Note that the original French publications are mentioned here to give an accurate timeline of influence, however later English translations were read for this work.

162. Cornelius Castoriadis, *The Imaginary Institution of Society*, trans. Kathleen Blamey (MIT Press, 1987), 184.

163. *ibid.*, 145.

164. Thus Gaonkar draws parallels between Castoriadis and Ricoeur when it comes to language (Dilip Parameshwar Gaonkar, “Toward New Imaginaries: An Introduction,” *Public Culture* 14, no. 1 (2002), 8).

165. *ibid.*, 10. It should be noted that Taylor himself draws more on the prior work of Benedict Anderson than Castoriadis (Charles Taylor, “Modern Social Imaginaries,” *Public Culture* 14, no. 1 (2002), 92).

Taylor frames his secularisation narrative in terms of social imaginaries, arguing that we have shifted from imagining the world as an ordered “cosmos” to a colder, lesser known “universe”.¹⁶⁶ The sense of the sublime, so important in Romantic thought, replaces genuine transcendence within the immanent frame, provoking in us a tension that pushes back against the closed circle of materialism that constitutes the modern social imaginary.¹⁶⁷ The present social imaginary of “expressive individualism” emphasises freedom of choice and tolerance as people seek authenticity in the way they live out their humanity.¹⁶⁸ Furthermore, Taylor makes the case that a particular *moral* vision has come to shape the social imaginary of Western modernity, one that derives from seventeenth century theories of natural law.¹⁶⁹ In this picture of society, people form a political entity against pre-existing notions of natural rights, and a version of the social contract emerges.¹⁷⁰ The modern moral order centres around mutual respect and benefit, and function and form are instrumentalised to the preservation of members as “free agents”, whereas the pre-modern moral order was directed toward excellence of virtue.¹⁷¹

Graham Ward focuses on the power structures at work in creating social imaginaries, the political nature of the “*making* of a belief believable”.¹⁷² This is a domain that depends on the work of the imagination; in creating belief in others “there is a reaching down into levels of human being that are profound, rooted in evolutionary development, neurological substrates, and somatic and affected conditions.”¹⁷³ In his exploration of the architecture of belief, Ward draws together the offerings of Lakoff and Johnson, and McGilchrist among others to paint a picture of belief (and “unbelief”) as a relational and affective mode of cognition.¹⁷⁴ Belief is strongly associated with imagination, and further galvanised by literature.¹⁷⁵ Myths

166. Taylor, *A Secular Age*, 325–327.

167. *ibid.*, 339.

168. *ibid.*, 478, 486.

169. Taylor, “Modern Social Imaginaries”, 92.

170. Taylor, *Modern Social Imaginaries*, 3–4.

171. *ibid.*, 12–13.

172. Ward, *Unbelievable*, 18–19.

173. *ibid.*, 19.

174. *ibid.*, 76.

175. *ibid.*, 77, 136.

are operative within social imaginaries, they invoke the imagination “to make us believe that this is the society in which we live or in which we should aspire to live”.¹⁷⁶ These mythic resonances can impact public reasoning in both good and evil ways, again highlighting the dangers that can be associated with the imagination.¹⁷⁷ Ward’s focus on the power dynamics at play in the creation of belief and social imaginaries leads us back to the necessity of listening to a diversity of stories.

8. The embodied character of imagination and understanding is affirmed.

N. Katherine Hayles recounts the story of “*how information lost its body*, that is, how it came to be conceptualized as an entity separate from the material forms in which it is thought to be embedded.”¹⁷⁸ As the previous chapter demonstrated, however, attending to the embodied dimension of knowing assists us in overcoming certain entrenched dichotomies. Lakoff and Johnson remind us that “our common embodiment allows for common, stable truths”, mediated through the imagination.¹⁷⁹

This is one point at which we might give a more concrete response to a particular type of technological enhancement. Given that our capacity to “know” is bound up in our embodied existence, the more radical proposal of “mind-uploading” is extremely problematic.¹⁸⁰ What would jettisoning the body do to our ability to make sense of our world? Husserl’s “intersubjectivity”, the “pre-conscious knowing” of Merleau-Ponty, and the *habitus* of Bourdieu all depend on a bodily experience that is somewhat shared. This also raises questions as to how a radical morphological freedom and diversity as a result of enhancing technologies might impact our present ability to comprehend the world and the other.

176. Ward, *Unbelievable*, 164.

177. Ward, *Unimaginable*, 224–225.

178. Hayles, *How We Became Posthuman*, 2, emphasis original. Note that Hayles uses the term posthumanism, however Thweatt-Bates critiques this as a conflation of posthumanist and transhumanist discourse, and considers Hayles’ characterisation more relevant to the latter (Thweatt-Bates, *Cyborg Selves*, 68).

179. Lakoff and Johnson, *Philosophy in the Flesh*, 6.

180. Thweatt-Bates, *Cyborg Selves*, 139.

Advocates of mind-uploading have recognised these concerns. Kurzweil thus argues that “a reinstantiated mind will need a body, since so much of our thinking is directed toward physical needs and desires” and imagines a virtual human body “version 2.0”.¹⁸¹ Bostrom makes a similar case for the use of simulated bodies that would permit uploads to experience the same sensations as a “regular” human body via virtual reality.¹⁸² There is also the notion of “extended cognition”, already operative as we augment our minds with tools and other devices, and the plasticity of the brain and its relationship with the body which allows for the possibility of new forms of embodiment.¹⁸³ Andy Clark’s view of the human self as “a constantly negotiable collection of resources easily able to straddle and criss-cross the boundaries between biology and artifact” comes close to the hybrid existence recognised in posthuman discourse.¹⁸⁴ The agent/world boundary is reconfigurable; human-machine interfaces are the outworking of a biological plasticity that humans have always enjoyed.¹⁸⁵

In fact, the reality of our imaginations being tethered to our bodily relations with the world means we may not even be capable of meaningfully imagining an entirely disembodied uploaded existence. It is perhaps not trivial that fictional uploaded minds tend to still adopt virtual bodies of some sort.

We might also draw connections between Bourdieu’s emphasis on the embodied dimension of “knowing”, the limitations of language, and George Lakoff and Mark Johnson’s extensive research into the neuroscience of metaphor. In their 2003 afterword to the original 1980 text of *Metaphors We Live By*, they demonstrate from a range of research perspectives that metaphors operate unconsciously, at the level of concept rather than just language, and are fundamentally embodied. They summarise one aspect of metaphor in understanding that resists linguistic articulation:

181. Kurzweil, *The Singularity Is Near*, 199.

182. Bostrom, “The Transhumanist FAQ”.

183. Andy Clark, “Re-Inventing Ourselves: The Plasticity of Embodiment, Sensing, and Mind,” in *The Transhumanist Reader: Classical and Contemporary Essays on the Science, Technology, and Philosophy of the Human Future*, ed. Max More and Natasha Vita-Moore (Wiley & Sons, 2013), 120.

184. *ibid.*, 124.

185. *ibid.*, 125.

... our metaphors will reflect our commonplace experiences in the world. Inevitably, many primary metaphors are universal because everybody has basically the same kinds of bodies and brains and lives in basically the same kinds of environments....¹⁸⁶

McGilchrist, too, highlights the embodiment and foundational nature of metaphor, as “the *only* way in which understanding can reach outside the system of signs to life itself”.¹⁸⁷ “Everything has to be expressed in terms of something else, and those something elses eventually have to come back to the body.”¹⁸⁸ McGilchrist also reminds us that the gap that metaphor is able to carry us across is not experiential, but artificially created by language.¹⁸⁹ Metaphor is not only a remnant of previous understanding, but can generate novel understanding.¹⁹⁰

Johnson goes further in another work, strongly connecting both reason and the imagination with the body in an examination of the structure of rationality.¹⁹¹ Challenging “objectivist” approaches, in which “the structure of rationality is regarded as transcending structures of bodily existence”,¹⁹² Johnson calls for a radical reorientation toward the *embodiment* of human understanding.¹⁹³ He resists entrenched epistemological and ontological dichotomies in Western thought that he argues have resulted in the idea that “imagination seems to exist in a no-man’s land between the clearly demarcated territories of reason and sensation”.¹⁹⁴ At the same time, he also avoids the pitfalls of an outdated faculty psychology approach to cognition.¹⁹⁵ Building on Kant’s work, Johnson thus concludes that

186. Lakoff and Johnson, *Metaphors We Live By*, 257.

187. McGilchrist, *The Master and his Emissary*, 115, emphasis original.

188. *ibid.*, 116.

189. *ibid.*, 116.

190. *ibid.*, 179.

191. Johnson, *The Body in the Mind*.

192. *ibid.*, x.

193. *ibid.*, xiii.

194. *ibid.*, xxix.

195. *ibid.*, 139–140. Coulson, too, warns against the tendency to view the imagination as a distinct mental faculty, separated entirely from reason (Coulson, *Religion and Imagination*, 6–7). This error appears on both sides of the debate over rationalism, as Charles Frankel points out: “The Irrationalist’s theory of human nature is steeped in the tradition of the dualistic psychology it condemns. It talks about ‘reason’ as though it were a department of human nature in conflict with ‘emotions’. But ‘reason’, considered as a psychological process, is not a special faculty, and it is not separate from the emotions; it is simply the process of reorganising the emotions” (Charles Frankel, “The Nature and Sources of Irrationalism,” *Science* 180 (1973), 930).

All meaningful experience and all understanding involves the activity of imagination which orders our representations (the reproductive function) and constitutes the temporal unity of our consciousness (the productive function).¹⁹⁶

This approach to cognition furthermore resists the tendency, identified earlier in this work, to set reason and imagination in opposition with one another. In parallel to McGilchrist's and Smith's comments on the inadequacies of philosophical discourse for bridging binary thought, Marcel Proust attests to the more general difficulty of speaking theoretically about aspects of understanding and cognition apart from the rational.

If intellect does not deserve the crown of crowns, only intellect is able to award it. And if intellect only ranks second in the hierarchy of values, intellect alone is able to proclaim that the first place must be given to instinct.¹⁹⁷

Another aspect of scholarship that foregrounds the embodied dimension of our existence can be found within posthumanism. Though the focus of this work has been on responding theologically to human enhancement questions that are most concentrated within transhumanist philosophies, the alternative proposals of posthuman discourse offer additional resources.¹⁹⁸

Donna Haraway is a leading representative of posthumanist thought, particularly known for her "cyborg manifesto". Cyborgs are not foreign entities, argues Haraway; *we* are cyborgs.

A cyborg body is not innocent; it was not born in a garden; it does not seek unitary identity and so generate antagonistic dualisms without end (or until the world ends); it takes irony for granted. One is too few, and two is only one possibility. Intense pleasure in skill, machine skill, ceases to be a sin, but an aspect of embodiment. The machine is not an it to be animated, worshipped, and dominated. The machine is us, our processes, an aspect of our embodiment.¹⁹⁹

196. Johnson, *The Body in the Mind*, 157.

197. Marcel Proust, *On Art and Literature*, trans. Sylvia Townsend Warner (Carroll & Graf, 1997), 25–26.

198. The difference between posthumanism and transhumanism is discussed on page 13.

199. Donna Haraway, "A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century," in *Simians, Cyborgs and Women: The Reinvention of Nature* (Routledge, 1991), 180.

Haraway arrives at the notion of the cyborg via a critique of feminist essentialism; all claims that would locate human identity in nature are challenged as importing patriarchal or colonial assumptions. Though addressing the technological dimension of human being, Haraway's proposals have little in common with the visions of transhumanists. Cary Wolfe contrasts the Renaissance and Enlightenment ideals of perfectability, rationality and agency inherent in transhumanism with Haraway's suspicion of reason, for example.²⁰⁰ Thweatt-Bates sets the cyborg against the transhumanist vision of mind-uploading, in particular, arguing that the two represent a bifurcation in the possibility of posthuman existence.²⁰¹

Thus Haraway also challenges dichotomies, in this case between nature and technology.²⁰² In many respects, this is an answer to Coeckelbergh's search for the "nonmachine" that can overcome the technology-human binary. Thweatt-Bates points out that transhumanist proposals tend to reinforce the nature/culture dichotomy through which posthumanism offers a way forward.²⁰³ It is important to note that the hybridity of humans is not a new development. Andy Clark and David Chalmers, to give one example, argue for the externalisation of cognition, using technology to extend the mind into the environment outside the body.²⁰⁴ This kind of hybridisation problematises Tolkien's wariness of technology – our experiences of the world have always been entwined with technology in some way.

9. Approaches to technology that instrumentalise non-human nature are challenged.

This point echoes Heidegger's critique of the "standing reserve".²⁰⁵ Tolkien's concerns around the impact of technology on the natural world were not unfounded, indeed the years since his death have seen even greater destruction than the industrial

200. Cary Wolfe, *What is Posthumanism?* (University of Minnesota Press, 2010), xiii.

201. Thweatt-Bates, *Cyborg Selves*, 15.

202. Anne Kull, "Mutations of Nature, Technology, and the Wetsern Sacred," *Zygon* 41, no. 4 (2006).

203. Thweatt-Bates, *Cyborg Selves*, 56.

204. Andy Clark and David Chalmers, "The Extended Mind," *Analysis* 58, no. 1 (1998).

205. Heidegger, "The Question Concerning Technology", 19.

havoc which so dismayed him. As Hefner reminds us, we live in the “technological civilization”, the era in which all natural systems are affected by human decision.²⁰⁶

Christian theology has been charged with a tendency toward anthropocentrism at least since the publication of Lynn White’s well-known exposition of the ecological crisis.²⁰⁷ Here we can point to and learn from theologies that have sought to correct various aspects of anthropocentrism. David Clough and Christopher Southgate both explore theologies that attend to the redemption of non-human animals, challenging notions of human exceptionalism.²⁰⁸ It is also not surprising that we should find multiple concerns coming together in theological critique: thus feminist theology often finds common ground with ecological critiques and liberation theology. Ivone Gebara’s *Longing for Running Water*, for example, is an ecofeminist work from a Latin American perspective, calling for a biocentric view of salvation. Speaking of Jesus, she reminds us that

He comes from here, from this earth, this body, this flesh, from the evolutionary process that is present both yesterday and today in this Sacred Body within which love resides. It continues in him beyond that, and it is turned into passion for life, into mercy and justice.²⁰⁹

Hefner offers a rather anthropocentric understanding of co-creation, not entirely surprising given his focus on theological anthropology. While he challenges instrumental views of non-human nature, he still preserves a special status for humans among the creation.²¹⁰ He does acknowledge those who would reject the created co-creator concept as too anthropocentric, yet articulates his own position as follows:

Fundamentally, to suggest that the ecosystem is defining itself decisively in *Homo sapiens* is to suggest that the human species stands in special relationship to God – a relationship that I designate as ‘co-creator’. To interpret the current situation as I have, with human beings poised as individuals, groups, and as a species on spaceship earth, bearing responsibility for discovering what ‘it is all about’, and acting upon that discovery – this

206. Hefner, *THF*, 48.

207. Lynn White, “The Historical Roots of our Ecologic Crisis,” *Science* 155 (1967).

208. David Clough, *On Animals* (Bloomsbury Publishing, 2013); Christopher Southgate, *The Groaning of Creation: God, Evolution and the Problem of Evil* (Westminster John Knox Press, 2008).

209. Ivone Gebara, *Longing for Running Water: Ecofeminism and Liberation* (Fortress Press, 1999), 190.

210. Hefner, *THF*, 230.

is to suggest that the human species has become an agent in the creative process in a way that cannot be attributed to any other species – either in quality or quantity.²¹¹

Indeed, Hefner suggests that we can understand the notion of the *imago Dei* to denote humankind's sharing in the creative activity of God.²¹²

The ecosystem is bathed in freedom in the sense that it is genuinely and fully vulnerable to the decisions and actions initiated by its own cutting edge of development, the self-defining *Homo sapiens*.²¹³

Others, however, would go further than Hefner does and extend this co-creative agency to non-human animals. Roberts contends that

the shared evolutionary history of all living species makes them all created co-creators to some extent and makes interspecies relationships constitutive of the image of God. While the divine image may be borne by human beings in distinct ways, it is shared with the rest of creation in at least this sense.²¹⁴

Even the doctrine of the *imago Dei* does not have to be understood in terms of human exceptionalism. Andrew Linzey, for example, promotes a creation-centric view of stewardship in his own functional interpretation of the *imago Dei*.²¹⁵ Herzfeld highlights relational interpretations of the *imago Dei* as obviating the essentialism that pervades substantive (and usually functional) approaches.²¹⁶ Attempts to understand the image of God often move quickly through ideas of human uniqueness to ideas of human superiority, but this need not be the case.

We can also listen to anthropologies that are distinctly non-theological. Scott Midson adapts Haraway's "cyborgology", which heavily critiques theology for anthropocentrism, ultimately disagreeing with Haraway in his argument that

theology is to be recognised as *part of* a problematic legacy insofar as its dominant anthropological perspective has lent itself well to humanocentric

211. Hefner, "The Foundations of Belonging", 175.

212. *ibid.*, 175. A substantive approach to the *imago Dei* can be uncovered in Hefner's use of the concept of nature, particularly when he refers to "our genetic heritage" (Midson, *Cyborg Theology*, 144; c.f. Hefner, *THF*, 27).

213. *ibid.*, 120.

214. Roberts, "'Fill and Subdue?'" , 52.

215. Andrew Linzey, *Animal Theology* (University of Illinois Press, 1994), 144–146.

216. Noreen Herzfeld, *In Our Image: Artificial Intelligence and the Human Spirit* (Augsburg Fortress, 2002), 90.

notions of human dominance, but it is also *part of* the way that we must rethink our understandings.²¹⁷

Midson lists a number of dichotomies that the cyborg may subvert due to its critical distance for reflection: “givenness and constructedness; Eden and Fall; paradise and sin; angels and beasts”.²¹⁸ Elaine Graham draws attention to a lingering dualism in Haraway’s work, however – that between immanence and transcendence, or sacred and secular.²¹⁹ While Graham sees the sacramentalism inherent in Haraway’s cyborg construction as incongruous, an artefact of her socialist-feminist rejection of religion, Thweatt-Bates more generously affirms a latent spirituality in Haraway that invites theological engagement.²²⁰

Thweatt-Bates does acknowledge the challenges of bringing Haraway’s cyborg into theological discourse, noting the rejection of the Christian tradition embedded into the construct.²²¹ However, she develops the notion of “hybridity” in a more theologically conducive direction, primarily by countering Haraway’s assertion that cyborgs have never belonged to Eden in her understanding of Adam and Eve themselves as cyborg figures.²²²

Other theologians have engaged with the idea of the cyborg in conjunction with ideas of human exceptionalism. Despite various critiques, Graham suggests that the cyborg might serve as a heuristic tool – it rejects “solutions of either denial or mastery in favour of a post/human ethic grounded in complicity with, not mastery over, non-human nature, animals and machines.”²²³ Hefner’s interest in the idea of the cyborg was noted earlier.²²⁴ Jeanine Thweatt-Bates suggests

217. Midson, *Cyborg Theology*, 24.

218. *ibid.*, 69, 86. Haraway herself lists an even more extensive number of dualisms overcome by the cyborg, including mind/body and God/man (Haraway, “A Cyborg Manifesto”, 177).

219. Elaine Graham, “Nietzsche Gets a Modem: Transhumanism and the Technological Sublime,” *Literature and Theology* 16, no. 1 (2002), 211.

220. Thweatt-Bates, *Cyborg Selves*, 83.

221. *ibid.*, 12; c.f. Haraway, “A Cyborg Manifesto”, 162. This is one of the reasons why Haraway was not selected as a central interlocutor for this project – though her work offers significant resources, the primary focus here was to begin with theologies of co-creation that sit within the Christian tradition.

222. Thweatt-Bates, *Cyborg Selves*, 172.

223. Graham, “Nietzsche Gets a Modem”, 228.

224. See page 103. We may also find parallels here with van Huyssteen’s scientifically-engaged theological anthropology, contending as he does that humans are in continuity with nonhuman

that “the hybrid embodiment of the cyborg serves as a symbol for the ontological kinship of the human with the nonhuman”.²²⁵ This challenges the anthropocentrism inherent in much of transhumanism, and thus the figure of the cyborg presents itself as a more natural ally for Hefner’s hypothesis that the human purpose is to serve the entire natural order within which it is embedded.²²⁶ Like Haraway, Hefner resists a nature/technology dichotomy at times

Now that we have broken down the walls that separate humans from both nature and technology, now that we are crossing the boundaries between these domains, we see that humans and their technology are a set of nature’s possibilities.²²⁷

However, Midson reasonably contends that Hefner misappropriates the cyborg in a more humanocentric way, locating “the specifically technological within the specifically human”.²²⁸ Midson highlights another important difference in the way Hefner interprets Haraway’s cyborg: whereas Haraway jettisons the notion that we can somehow define human being, Hefner maintains some sense of normalisation.²²⁹ Incorporating these various critiques into a theological anthropology is a step in the right direction when it comes to envisioning a technological future that does not instrumentalise non-human creation for human interests.

We may, therefore, draw together several attempts to escape the restrictions of entrenched dichotomies in the way we understand ourselves and the world. From a variety of different starting points, scholars are highlighting the interconnectedness of nature and culture, and the embodied nature of mind and cognition, and recognising that this troubles historical dualisms in Western philosophy. Though Bourdieu, for

nature, and that the *imago Dei* emerges from nature itself (Wentzel van Huyssteen, *Alone in the World? Human Uniqueness in Science and Theology* (Eerdmans Publishing Co., 2006), 322).

225. Thweatt-Bates, *Cyborg Selves*, 5. This also accounts for Haraway’s more recent scholarly focus on companion species (*ibid.*, 104).

226. See page 78.

227. Hefner, *Technology and Human Becoming*, 77. While Hefner does challenge some aspects of human exceptionalism, he still accords “much more worth” to humans over their “lower kin” (Hefner, *THF*, 85).

228. Midson, *Cyborg Theology*, 142. Hefner himself confirms the anthropocentrism in his proposals (Hefner, *Technology and Human Becoming*, 76–77).

229. Midson, *Cyborg Theology*, 139. In sympathy with the analysis of Hefner presented earlier in this work, Midson attributes this difference to Hefner’s greater certainty when it comes to metaphysics (*ibid.*, 140).

example, is concerned with slightly different dichotomies to those identified here as operative in co-creation theologies, his articulation of the *betweenness* of *habitus* may offer some tools for how we conceive of imagination and its relationship to reason and epistemology more generally. Metaphor is not *either* conceptual *or* linguistic, but *both*, and draws on bodily relationships to the world to generate meaning. The intellect and affect are both embodied as well, relying on the imagination and unable to be disentangled from the imagination. Dichotomies break down as we try unsuccessfully to examine each faculty in isolation and distinguish an independent function. Following along these line of enquiry that acknowledges a “betweenness” or a sense of “hybridity” with respect to traditional dichotomies, resisting the tendency to construe the imagination as opposed to reason, or technology as antithetical to nature and virtue, may open up new ways of conceiving of human activity and responsibility from a theological perspective as we are confronted with questions of human enhancement.

10. Elements of the visions of transcendence inherent in transhumanist thought are reclaimed as central to a Christian imagination.

Challenging dichotomies in this fashion restores the imagination to a central place in a response to transhumanism. As raised earlier, there are a number of common elements between transhumanist visions of the future and Christian eschatology.²³⁰ The language of transhumanism is replete with references to gods, salvation, heaven and the like. Presented in ways that “recruit” the imagination (as Smith puts it), the visions of transcendence and glorification proclaimed so confidently in transhumanist literature are ripe for reclamation by Christian theologians, philosophers, writers and artists. We might respond with a fuller vision of the human future, a greater hope to set alongside the imaginings of transhumanists and techno-utopians.

Whereas technology itself tends to occupy many of the classic roles of a deity in the present technological paradigm, theologians are able to expose the “pretensions to self-love” inherent in certain technological mindsets.²³¹ A Christian account

230. See 1.2.1.

231. Brock, *Christian Ethics in a Technological Age*, 376–379.

of hope declares that in conceiving, assessing and implementing technologies, we bear neither the burden of correctly envisioning or accomplishing redemption for ourselves nor the risk and dread of complete failure. Technology occupies its proper place within the work of a gracious God who allows creation to participate in bringing the creation toward glorious fulfilment.

In this respect, by setting imaginative portrayals of Christian hope alongside transhumanist projections of the future we might think of theology as entering the “tournament of narratives”, to return to McClendon’s phrase.²³² A theological anthropology that is robust and resilient, engaging the challenges of the day, is well-resourced to compete for people’s imagination in the present pluralistic context.

It should be clear at this point that an emphasis on moral imagination is not going to offer directives in specific ethical cases, including those relevant to human enhancement (apart from those which pose a threat to embodiment). Moral theories (or even laws) can only ever provide clear guidance for the most straightforward of cases.²³³ Johnson summarises the outcome of a shift toward the moral imagination.

We will reflect and act differently, because we see the importance of moral perception and discernment, of imaginatively taking up the part of others, and of envisioning alternative possibilities for composing situations in ways that contribute to human flourishing.²³⁴

Obviously, the fact that we can imagine something about the future does not mean it will or should come true. Much of the distrust of the imagination stems from the fact that its realm is so large. If we can imagine the wildly fantastic, what use is it to us as we try to say anything real about the present or future? John Tyndall, addressing the Royal Society in 1870, suggested that

There are Tories in science who regard Imagination as a faculty to be avoided rather than employed. They observe its action in weak vessels and are unduly impressed by its disasters. But they might with equal justice point to exploded boilers as an argument against the use of steam.²³⁵

232. McClendon, *Systematic Theology: Ethics*, 143.

233. Johnson, *Moral Imagination*, 187.

234. *ibid.*, 215.

235. Tyndall, *Scientific Use of the Imagination*, 6.

Let us not explode the boiler of imagination by treating science fiction as straight up prophecy. But let us not underestimate the value of the imagination as a resource for both theological reflection and communication either. Kevin Vanhoozer makes a similar point, arguing that the existence of vain imaginings “no more disqualifies the imagination from serving theology than the existence of logical fallacies disqualifies reason”.²³⁶ By thinking about enhancement technologies within the context of the moral imagination, however, we are freed from the requirement or impulse to develop a prescriptive, propositional approach to technological assessment. Brock reminds us that the Christian gospel “reveals as good news human ingenuity and the richness of creation’s given material order, insisting that the two can come together in the creation of good and beneficial techniques and mechanical artefacts”.²³⁷ In making this statement he affirms two basic claims: that human collaboration with God’s work can compete with mixed motives in a world that is still being redeemed, but also that we are freed from “the burden of ensuring that God triumphs over the powers of this age”.²³⁸

Chapter Conclusion

The theological anthropology gestured toward here combines Hefner’s interest in the technological future and the biocultural nature of humans with Tolkien’s affinity for the imagination, both literary and moral. This type of synthesis requires additional resources in order to challenge existing dichotomies of thought between imagination and reason, nature and technology, and mind and body. Incorporating wide-ranging threads of the phenomenological tradition, cognitive sciences and metaphor, and posthuman discourse, Hefner’s and Tolkien’s articulations of human creativity are brought together, promising a fruitful engagement with proposals for human technological enhancement.

236. Kevin Vanhoozer, “Imagination in Theology,” in *New Dictionary of Theology: Historical and Systematic*, 2nd ed., ed. Martin Davie et al. (InterVarsity Press, 2016), 442.

237. Brock, *Christian Ethics in a Technological Age*, 381.

238. *ibid.*, 380–381.

Conclusion

Technologies that promise various improvements to human abilities are continually being imagined, and a number of technological augmentations are beginning to be commercially available. Through film and print media, both fiction and journalistic, we are awash with visions of technologically enhanced human existence to the extent that some degree of enhancement appears inevitable.

This work begins with the pragmatic acknowledgement that technological “progress” continues, usually more rapidly than the ethical reflection that would ideally accompany technological research and development. Considering the role of theological discourse when it comes to technological assessment, it concedes that a Christian worldview no longer represents the dominant voice in the public sphere (at least in the West) and does not seek to recapture the authority it may have exercised in the past. Christianity must enter the “tournament of narratives”, offering a particular account of what it means to be human that is compelling when set alongside competing visions.

For many, the church is perceived as against the kinds of technologies that alter our biological makeup. The charge of “playing God” is often used as a conversation-ender, a firm boundary around scientific enterprise across which humans are prohibited from trespassing. In search of resources within the Christian tradition that do not automatically recoil at the idea of human enhancement, theologies that represent humans as co-creators with God in some fashion were explored. Philip Hefner’s anthropology of the “created co-creator” was selected as particularly relevant, given its construction within the context of science and religion and the fact that he at times explicitly addresses technology and transhumanism.

A closer examination of Hefner’s theological anthropology finds it to be a good starting point for engaging with human enhancement questions, as it locates human

being and becoming within our evolutionary history and our connectedness with the non-human world. Hefner underscores creativity as fundamental to human nature, and accords real agency, and responsibility, to us in employing our creativity to ensure a better future for all creation. His tendency to avoid theological concepts such as “sin” in much of his work, coupled with his related methodology of translating theological content into scientific statements, means that he gives less attention to both the effects of fallenness on our ability to co-create and the ensuing need for discernment. The role of the imagination in knowing and discerning is also sidelined in his construction, though he does affirm its importance at various points. With the prevalence of imaginatively rich epistemologies developed within science and theology as distinct disciplines, it is surprising that the imagination has received relatively little traction in the science and religion field. Is it possible to bring science and theology together in an account of co-creation, without diminishing both or reducing one to the other?

For this reason, Tolkien was brought into the conversation as a thinker who also views humans as creators in imitation of the Creator, and who locates the imagination at the centre of his anthropology of sub-creation. His general aversion to technology renders him a complicated dialogue partner when it comes to human enhancement concerns, however his synthesis of imagination and reason, myth and reality in his vision of human creativity compensates for many of the shortcomings in Hefner’s approach. He has a much stronger account of sin and its noetic effects, as well as the role of great stories in recruiting people’s imaginations toward a particular vision and understanding of reality. Yet Tolkien attempts to neatly divide nature and technology into distinct entities, and looks to Edenic paradise with a simple nostalgia.

The present contribution thus seeks a middle ground, combining Hefner’s understanding of humans as inherently technological and Tolkien’s understanding of humans as fundamentally mythopoetic. Drawing on a wide range of scholarship (as surveyed in the previous chapter) that challenges dualisms between reason and the imagination, nature and technology and the mind and body, the contours of a contemporary theology of co-creation, situating human creativity firmly within

a broader doctrine of creation, are mapped out. As described, the characteristics of a fruitful approach will include:

1. Humans must be understood as products of a creative “evolutionary” process.
2. Creativity is central to human agency and responsibility.
3. Human creativity is modelled on divine creativity.
4. Scientific insights are respected and incorporated into an understanding and description of what it means to be human, without reducing theological and philosophical claims to scientific ones.
5. Technology is considered a legitimate exercise of human co-creativity.
6. Humans are recognised as story tellers and myth makers at their core, with narrative central to the way in which we understand the world.
7. The formation of the moral imagination is given due accord, including the diversity of stories which shape our moral imaginary.
8. The embodied character of imagination and understanding is affirmed.
9. Approaches to technology that instrumentalise non-human nature are challenged.
10. Elements of the visions of transcendence inherent in transhumanist thought are reclaimed as central to a Christian imagination.

Affirming humans as creators in imitation of and to the glory of our Creator, all the while attending to the narratives that shape our technological imagination and use, we are able to locate the possibilities of human enhancement technology within a responsibility to create carefully, in ways that do not perpetuate inequality or instrumentalise non-human nature. The compelling visions of transhumanism that resonate with so many might be rehabilitated and recalibrated by the acknowledgement that we are not ultimately the agent of redemption, and the future glory in which we hope is not entirely of our own design.

Engineering Sleep: A Test Case

Acknowledging the impossibility of a simple checklist for evaluating particular technologies, it may help to consider what this framework might look like applied to a specific technological enhancement. We may, perhaps, imagine a scenario in which various technological means reduce our dependency on sleep without the host of negative consequences that presently accompany sleep deprivation. “Sleep engineers” may develop a way to maintain the neurological advantages of sleep while increasing periods of wakefulness and reducing overall sleep duration. At the very least, the effect of our existing circadian rhythm in producing a mid-afternoon trough in alertness, a phenomenon attended to in our past through biphasic sleep patterns but now vastly out of sync with many contemporary cultural practices,²³⁹ might be mitigated against as a form of human enhancement.

Theologically, we might wish to consider the importance of sleep generally as part of creaturely finitude, and within an appreciation of “rest”. Sleep reminds us daily that we are not God, that our capacities can be exhausted, that we require ongoing sustenance. Our biological need for rest and renewal has its spiritual counterpart, whether people turn to prayer and meditation or other recreational practices. Even without a physical dependency, life without periodic rest is likely to be experienced as a burden. At the same time, the Christian practice of vigil shows us that abstaining from sleep is beneficial in some circumstances. We understand the failure of Jesus’ disciples to remain awake in the garden of Gethsemane to be essentially a moral lapse, for example.

Our reflection on the potential enhancement of sleep ought to be informed by scientific research. Though sleep researchers are yet to reach consensus as to the essential function(s) of sleep, they are certainly united in their conclusion that sleep is crucial.²⁴⁰ Perhaps our dependency on sleep therefore ought not to be engineered

239. Charles Nunn, David Samson, and Andrew Krystal, “Shining Evolutionary Light on Human Sleep and Sleep Disorders,” *Evolution, Medicine, and Public Health* 2016, no. 1 (2016).

240. Shinichi Miyazaki, Chih-Yao Liu, and Yu Hayashi, “Sleep in Vertebrate and Invertebrate Animals, and Insights into the Function and Evolution of Sleep,” *Neuroscience Research* 118 (2017); J. Krueger et al., “Sleep Function: Toward Elucidating an Enigma,” *Sleep Medical Review* 28 (2016).

entirely away; the fact that evolution has not produced an entirely sleep-free existence in any other higher order species suggests that sleep retains vital functions.²⁴¹ The benefits of a rhythm of rest are attested scientifically.²⁴² The scientific support for retaining some amount of sleep (though the degree may be disputed) aligns with the theological and philosophical reflections on the advantages of sleep. Any reduction or eradication of sleep through technological means must match the benefits currently obtained through sleep, or provide some disproportionate advantage.

Like the majority of technologies (and therapies) that presently exist, a sleep enhancement would certainly allow for the possibility of abuse. The very fact that current research into sleep enhancement is overwhelmingly conducted in military settings, with visions of a 24-hour soldier, attests to the potential for misuse.²⁴³ Yet we can imagine scenarios in which an ability to function without negative consequences on less or even no sleep (at least for short periods of time) could serve the good, and express love for others or work toward renewing the creation (as Brock and Cole-Turner both remind us is the rightful employment of technology).²⁴⁴ In disaster relief scenarios, or being present with a loved one at the very end of life, for example, this kind of enhancement can perhaps be used lovingly and wisely.

This more practical exploration has been necessarily brief and tentative in nature, however we can already see that “enhancement” in itself need not threaten a theological understanding of humans, their place in the world, or the larger picture of God’s work in salvation history. It becomes a matter for ethical deliberation like any other,²⁴⁵ deliberation that takes place within an already formed but (hopefully)

241. This is not to suggest that evolutionary limitations should dictate what we might accomplish with technology, of course, but it is a source of insight. In considering evolutionary significance we must avoid dichotomising nature and culture/technology as previously discussed,

242. Russell Foster and Katharina Wulff, “The Rhythm of Rest and Excess,” *Nature Reviews Neuroscience* 6 (2005).

243. E. Williams, “Human Performance,” March 2008, <https://fas.org/irp/agency/dod/jason/human.pdf>.

244. Brock, *Christian Ethics in a Technological Age*, 235; Cole-Turner, “Religion, Genetics and the Future”, 213.

245. The identification of human enhancement questions as the proper subject of ethical enquiry has already been affirmed by advocates such as Bostrom and Savulescu, however this recognition has not entirely penetrated alternative circles, including certain religious contexts (Nick Bostrom and Julian Savulescu, “Human Enhancement Ethics: The State of the Debate,” in *Human Enhancement*, ed. Nick Bostrom and Julian Savulescu (Oxford University Press, 2009), 18).

dynamic moral imaginary in which the imagination works to generate and deliberate over potential scenarios of use or abuse.

A Productive Approach

So where might this approach to human creativity be productive? The novelty of the specific co-creation theology articulated in this chapter lies partly in its ability to engage contemporary debates around hybridity and embodiment. The strengths of a scientifically-oriented anthropology are retained, while the constraints of earlier models that sought to integrate science and theology do not apply. The co-creation theology sketched out here is unapologetically *theological* in its starting point. It operates within a Christian worldview, yet seeks to understand human being in terms that are also compatible (though not synonymous) with what we can know from scientific enquiry. This is an approach that is likely to gain more traction now that the science and religion field is maturing, and moving on from the need to justify theological claims through translation into scientifically verifiable proposals.

At the same time, the imaginative and artistic dimensions of co-creativity are fleshed out – brought to the fore even. Resisting sharp distinctions between different types of “making” such as art and technology permits a more integrated vision of human creativity. We have tended to be more comfortable with the idea that art forms can mirror divine creativity in some way, perhaps because we can more easily classify art as beautiful, but expanding the territory of the creative imitation of the divine (imitation, of course, reminds us of the boundaries) into the realm of technology gives us new vantage points from which we can reflect on morality. This also intersects with contemporary accounts that ground our thinking about technology within more traditional understandings of what it means to practice a craft well, in dialogue with historical understandings of τέχνη and its relation to virtue and the good life.²⁴⁶ Of course, this issues a number of challenges for how we think about technology today, suggesting a move away from

246. See for example Sennett, *The Craftsman*.

the contemporary emphasis on self-expression and individuality in design towards a more reflective practice of craftsmanship.

The contemporary contrast between the artist and the engineer is not all that helpful when it comes to technologically enhancing human characteristics and abilities. We may not be able to return to the earlier aesthetic spirit that animated scientific discovery and technological innovation in bygone eras, but perhaps we can find a new expression of creativity in technology that pushes back against more clinical, instrumentalising methodologies. Heidegger continues to resonate in such undertakings.

The critique of technology offered by Tolkien is representative of his historical location, understandable against the backdrop of his wartime experiences and the rapid industrialisation of the English countryside. We might even say that in that particular historical moment critics played a vital role in countering the overly optimistic narrative of technological progress. Tolkien's work also represents a key challenge to the atomising, reductive tendencies of his time. At the same time, more contemporary discourse has revealed the fallacies present in distinguishing too neatly between nature and culture or nature and technology – not only is technology somewhat inchoate a concept, but in reality it is entangled with our existence in ways that Tolkien simply does not do justice to in his own treatment of the subject. For the most part, his wariness of technology prompted him into imaginative forays that were nostalgic, and perhaps escapist, in the sense that they avoid attempting to envision a more positive future that is at the same time technological. We may retain his capacity for *mythopoeisis* and his intuitive understanding that narrative can communicate and inspire commitment to grand visions, while simultaneously engaging the present technological landscape in a more pragmatic fashion.

The proposed approach is thus fruitful in that it understands narrative accounts to do important work, recruiting imaginations in their articulation of a particular way of being. It encourages engagement with both the sciences and the arts and humanities as valuable for understanding the human condition and reflecting on future possibility. It also acknowledges the particularity of story, and the need

for visions of what a good life ought to look like (and the associated goals of enhancement) to be formed by a plurality of stories, located in particular times, places, cultures and bodies.

With a greater blurring of boundaries between nature, culture, technology and the embodied mind, this enriched iteration of previous theological anthropologies is far better resourced to address questions of human enhancement, which inherently confound these traditional boundaries, than Tolkien's stark contrasts. While Hefner comes closer to the mark in his understanding of humans as biocultural organisms, this model additionally avoids his tendency to collapse culture into evolutionary science, and to define it in strongly anthropocentric terms.

Thus, a constellation of contemporary discourses are identified within which the proposed approach to human creativity as it impinges on human enhancement debates might operate and flourish. As scholarship continues to pursue a more integrated approach to understanding human being and relationship with the non-human world in all its complexity, it will continue refining a theological anthropology that can support ongoing ethical deliberation over how and what we create.

While this framework for co-creation does not produce quick or easy answers to the various forms of enhancement we might devise, it does solidify a few guidelines. Enhancements that radically alter the human body, or eradicate biological existence entirely, require careful assessment as to how drastic changes to our present embodied existence might impact our common metaphorical understanding, mediated through our bodily experience of the world.

Though enhancements that threaten to eradicate a physical body entirely have been cautioned against, other potential enhancements may be more benign. For the most part, potential enhancements can be framed as warranting ethical deliberation over their use in much the same way as any other kind of technology. If a pill improves our concentration in prayer, should we take it? Do we lose something in foregoing the process of disciplining our minds and wills in favour of a technological solution, or does the end result justify this kind of approach? These are not new quandaries, though the technological means itself might be novel.

Thus greater attention to the moral imagination, and the way it is being formed, is the appropriate anchor to which reflection on co-creation through human enhancement technologies ought to be tethered. For those hoping for more specific guidance, this conclusion might be frustratingly general, however it is only by exploring the imaginative dimensions of the way in which our hopes and visions of the future are shaped that theological reflection on the human future might fruitfully engage human enhancement debates in the wider sphere.

Future Directions

The previous chapter indicates a number of directions in which the present study might be expanded or complemented. For example, a greater attention to the competing visions of human flourishing that underpin various attitudes toward human enhancement would be fruitful.²⁴⁷ A Christian vision of the good life answers both the secular humanist respect for human finitude and the transhumanist hope for glorious transformation, thus may be presented as a vital dialogue partner in the enhancement debate. Gaymon Bennett's recent anthropology of the imagination and practice of human dignity over the past half-century, attending to the power structures at play in bioethics and biotechnology, exemplifies the approach required: it steps back from the particular technologies of the field and considers the assumptions, unstated beliefs and practices in which this technological innovation occurs.²⁴⁸ An examination of concepts of human flourishing operative in the same sphere would be fruitful both for understanding and evaluating competing attitudes towards human enhancement, and for future dialogue with innovators of enhancement technologies. Additionally, the articulation of a Christian vision of human flourishing that specifically addresses questions surrounding human

247. This was explored briefly in 5.4.2.

248. Gaymon Bennett, *Technicians of Human Dignity: Bodies, Souls, and the Making of Intrinsic Worth* (New York, 2016).

enhancement will equip theologians and the church more generally as they are confronted with the emergence of such technologies.²⁴⁹

The importance of listening to diverse portrayals of both present human experience and what an ideal human ought to be was raised earlier. Much remains to be done in this area. This is connected to the previously identified path of interrogating visions of human flourishing, and theological reflection on what constitutes a good life will be more representative and just if it does not reinforce certain “normative” accounts of human being.

This work has mainly focused on the role of literature in shaping our imagination of the future of human being. Other forms of art ought to be explored further as equally formative for our moral imagination.²⁵⁰ The discussion here is also very much at the conceptual level, a long way from any practical implementation that would see artistic sensibility and imagination brought explicitly into the realm of technological innovation. A more direct engagement with both technology developers and users that encourages a more reflective stance toward technology is desirable, and future efforts should be oriented toward that goal.

The relationship between moral imagination, the arts and Christian faith has implications for apologetics too. Presented in ways that “recruit” the imagination, the visions of transcendence and glorification proclaimed so confidently in transhumanist literature are ripe for reclamation by Christian theologians, philosophers, writers and artists. There are rich collaborative opportunities for presenting an imaginative account of the future, and technology’s role in it, from a Christian perspective that offers neither a fearful response to technological innovation nor a wholehearted embrace of technological “redemption”.²⁵¹

249. A greater exploration of philosophy of technology would also enrich the present study, particularly as we think through how to incorporate more imaginative and artistic dimensions into our technological development and practice.

250. Jeremy Begbie edits a helpful collection for understanding the incarnation in a range of arts, however a consideration of human enhancement in particular would be interesting (Jeremy Begbie, ed., *Beholding the Glory: Incarnation Through the Arts* (Darton, Longman & Todd, 2000)).

251. The need for a more imaginative approach to apologetics is outlined in Davison, *Imaginative Apologetics*. The establishment of the Institute for the Imagination, Theology, and the Arts at the University of St. Andrews is an example of the increasing scholarship undertaken in this area.

While enhancement has been treated more generally at the conceptual level here, the idea of *moral* enhancement in particular requires much more reflection.²⁵² One of the problems when it comes to moral enhancement is determining what precisely is moral. Thomas Douglas advocates for moral enhancement, yet states his intention to “avoid committing [himself] to any particular view about what determines the moral goodness of a motive”.²⁵³ He does, however, make the argument that the attenuation of several “counter-moral” emotions would “sometimes” constitute a moral enhancement.²⁵⁴ Asking the question of “what is moral?” in conjunction with so-called “moral” enhancements may well demonstrate that “behavioural engineering” is a more appropriate term. This would have knock on consequences for authority, enforcement and control that require further exploration.

The notion of moral enhancement leads us naturally back to the question of sin and fallenness. Hamartiology becomes significantly complicated by a commitment to the evolutionary origins of human beings, and traditional accounts of the fall require some revision. This work was unable to extend to a comprehensive doctrine of sin, but its questions around human responsibility and agency with respect to technology would benefit from further reflection on the extent to which our fallenness impacts them. In addressing questions that concern creation and redemption, the associated doctrine of providence would also be a crucial part of a more systematic approach.

The present research highlighted a number of thought dichotomies that were impacting many perspectives on human creativity today. Many of these concepts (e.g. imagination, reason, τέχνη) have long pedigrees in the history of ideas, and an examination of their historical development would enrich the present discourse.²⁵⁵ A more historical approach would also connect with the focus on human flourishing outlined earlier. Both transhumanist and secular humanist ideals look to earlier

252. A preliminary exploration of the relationship between virtue and moral bioenhancement is given by Adam Willows, “Supplementing Virtue: The Case for a Limited Theological Transhumanism,” *Theology and Science* 15, no. 2 (2017).

253. Thomas Douglas, “Moral Enhancement,” in *Enhancing Human Capacities*, ed. Julian Savulescu, Ruud ter Meulen, and Guy Kahane (Wiley-Blackwell, 2011), 468.

254. *ibid.*, 470.

255. The kind of examination that Peter Harrison provides for the historical evolution of the terms “science” and “religion” comes to mind (Peter Harrison, *The Territories of Science and Religion* (University of Chicago Press, 2015)).

humanisms as a part of their ideological heritage. There is need for a sustained study that compares these positions in greater depth, and considers the extent to which they draw on historical forms of humanism in their conceptions of the good life. Transhumanist roots are often located in Enlightenment thought, yet many transhumanists express their admiration for classical and mediaeval philosophies of humans forming themselves. Given the shared respect of secular humanists and transhumanists for thinkers such as Francis Bacon and Julian Huxley, it is worth exploring the points at which their notions of human flourishing diverge, and whether these are prescriptive for their perspectives on human enhancement.

We have seen how the question “should humans enhance themselves?” dissolves with a little probing; clearly we have always been in the business of enhancing ourselves. Overwhelmed by the montage of neural implants, nootropic drugs, gene-editing precision, and do-it-yourself “augmentations” in the form of magnetic and RFID implants, that make up just a fraction of the more feasible technologies accessible now or in the near future (not to mention the vast array of “enhancing” technologies that exist external to the body), we must resist categorising these prospects as entirely novel or separate from other types of technology. Therefore, continuing to locate reflection on human enhancement within developments in philosophy of technology and moral theology more generally will curb the tendency to cordon off enhancement debates as exceptional, and broaden the pool of available resources for ethical deliberation.

The final word is left to Hefner, who at once captures the expansiveness and fecundity of exploring questions of human becoming at the nexus of theology and science, and the present unresolved, and often uncomfortable, nature of these explorations.

What is the significance of the fact that... God has set up a system in which the creatures who transcend humans in the chain of evolution may be creatures we have designed and created, so that their act of transcending us is at the same time our own act of transcending ourselves?²⁵⁶

256. Hefner, *Technology and Human Becoming*, 80.

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