Sketches Towards a Theology of Technology: Theological Confession in a Technological Age

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Abstract

This thesis will argue that information technology (IT) has given rise to a cultural mythology which offers a competing theological model to the model offered by kerygmatic Christian theology. The theological model advocated by IT culture regards human technical creativity and material culture to be the means by which ultimate concern can be mediated and satisfied. This model will be judged inauthentic, when theological authenticity is measured in terms of a theology's ability to point beyond itself – to the transcendent and the infinite – as the symbol of that which is truly ultimate. This inauthentic 'techno-theology' purveyed by IT culture will be contrasted with a theology of technology, which seeks to engage technology hermeneutically by finding the meaning of technology at the nexus of its use and invention, and by judging the appropriateness of technology against the norm of the Christian kerygma. It is hoped that by contrasting techno-theology with a kerygmatic theology of technology, that an ethics of technological practices may be approached.

The inauthentic theological model proffered by IT culture is based upon two fundamental errors, called in this thesis 'technological essentialism' and 'cybernetic totalism'. The former argues that technology possesses an unchanging or unchangeable essential nature. The latter argues that cybernetics or IT provides the pre-eminent means of understanding self and world. These errors will be evidenced in contemporary IT writings where IT is figured in either idealised or speculative terms. The essentialising and totalising tendencies found in idealised and speculative IT will be contrasted with the more preferable treatment of IT as figured in the realism of cybernetics research and the critically self-reflective treatment of IT in fiction and film.

The context for this thesis will be the contemporary information technology culture, running from roughly the mid 1980's to the present, with specific attention given to the phenomenon of posthuman discourse to which this culture has contributed. Of the four types of information technology examined in this thesis (actual/realistic, idealised, imagined, and speculative), examples of actual IT will be taken from cybernetics research and computer science; examples of

idealised IT will be taken from philosophical and theological treatments of virtual reality, cognitive science and artificial intelligence research; examples of imagined IT will be taken from science fiction literature and film; and examples of speculative IT will be taken from speculative science with a specific interest in posthumanism and radical life extension.

Having argued against the two fundamental errors contributing to techno-theology and having given examples from contemporary IT and speculative science which evince this inauthentic theological model, this thesis will conclude by making sketches towards a theology of technology.

Thanks & Dedication

This thesis reflects the influences of many gifted individuals who have contributed to my intellectual and personal formation during the course of my PhD research. I would like to begin by thanking Dr. Jeffrey Keuss. Without his initial encouragement, supervision, and patience I would never have started much less completed this thesis. I also wish to thank Professor David Jasper and Rev'd Dr. Michael Fuller who took this project under their wings during its formative stages. They provided me with invaluable guidance and insight. It was with great forbearance that they were willing to read hundreds of manuscript pages, suffering in silence through my literary deluge. A project such as this could not have imagined a better team of supervisors.

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Lastly, I dedicate this thesis to my wife Julia who has kindly supported a moody PhD student for over three and a half years. Despite what Belle and Sebastian sing, she never complained that she was 'tired of fixing things for Michael or the rest of them.' Not only has she kept me sheltered and well fed, but she has provided me with a sense of home and security that I shall never be wont to find elsewhere. Her willingness to sacrifice so much, to risk moving so far from home, and to take up a semi-nomadic life in Glasgow's West End – all to pursue her husband's crazy-dream of receiving a PhD – is more than anyone should ever have to ask of their partner. She never grumbled, never complained, and always offered me nothing but love, support, and kindness. In light of her many sacrifices and her unwavering and indefatigable faith in us, I dedicate this work to her.

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Introduction

This thesis will argue that information technology has given rise to a cultural mythology, typified by posthuman discourse, which offers a competing theological model to the model offered by kerygmatic Christian theology. The theological model which is advocated by IT culture regards human creativity and material culture to be the means by which ultimate concern can be mediated and satisfied. This model will be judged inauthentic, when theological authenticity is measured in terms of a theology's ability to point beyond itself – to the transcendent and the infinite – as the symbol of that which is truly ultimate. By giving rise to symbols which are used to establish what constitutes the 'good', or to convey a hope for a better life or victory over finitude, IT culture functions as a quasi-religion. The self-authenticating theological model of this quasi-religion points to immanent and finite realities as the succour for human existential need. I will contrast this 'techno-theology', defined here as a theology which emerges from technology-culture, with what I will call a theology of technology, that is, a theology which seeks to ground the use and development of technology within the context of a pre-existing theological framework. As such, technology is approached hermeneutically, finding the meaning of technology at the nexus of use and invention, and judging the appropriateness of technology against the norm of the Christian *kerygma* and the care for the other which the *kerygma* demands. It is hoped by contrasting this techno-theology with a kerygmatic theology of technology, that an ethics of technological practices may be approached.[1]

The context for this assertion will be the contemporary information technology culture, running from roughly the mid 1980's to the present, with specific attention given to the phenomenon of posthuman discourse to which this culture has contributed. Although this approximately twenty-five year period will be the primary scope for this thesis's argument, in order to buttress this assertion with adequate historical, philosophical, and technological support, extensive exposition

[1] The terms 'theology' or 'techno-theology' and 'religion' or 'quasi-religion' are not as interchangeable as they may seem. I intentionally reserve the term 'theology' for an established collection of specific beliefs and practices which stem from a more universal religious context. Theologies, therefore, are the particular manifestation of the universal religious or quasi-religious predilection.

will be pursued in an effort to establish taxonomy and nomenclature, by providing the philosophical, historical, and material context of IT in particular and technology in general. In Section one, the history of technology, the philosophy of technology, and an introduction to the development and application of cybernetics and IT will be provided in order to trace the development of two crucial mistakes made within IT culture regarding the nature and potential of technology. The first, technological essentialism, asserts that a reified Technology possesses an essence which avoids critique or curtailment. The second, cybernetic totalism, argues that reality is made more real when approached through cybernetic analyses. In Section two, the emphasis will shift to the cultural appropriation of IT, by examining posthuman discourse in fiction, film, theory and speculative science. Here, I will note how technological essentialism leads to cybernetic totalism which in turn contributes to the formation of a techno-theology, a system of belief (implied or otherwise) in which technology becomes a means of conveying ultimate concern. The two halves of this thesis, Section one: 'The Philosophical, Historical, and Material Considerations' and Section two: 'Posthumanism: The Techno-Theology of IT Culture', constitute a unique and holistic analysis of the topic at hand, by implementing a hermeneutics of technology which takes into consideration a technology's material-historical context and its imagined or speculative appropriation within a given culture.

It should be noted that the culture described by this thesis is not exclusively the economic or engineering cultures that have produced IT. Rather, this thesis is primarily concerned with the mythic culture which has surrounded actual information technologies since their inception. The myths surrounding IT, as told by scientists, theorists, writers, filmmakers and engineers alike, re-frame actual developments in information technology through a lens influenced by technological essentialism and cybernetic totalism. The chief example of this will be discussed in the second section of this thesis with regards to posthuman life extension. For the speculative scientists described in chapter eight, the ability of actual information technology to mimic what appears to be a conscious mind, is taken mythologically to signal the future of human-computer co-evolution. Actual artificial intelligence research (described in chapter five) is a far cry from the 'spiritual machines' described by Ray Kurzweil in Chapter eight, yet as will be discussed, this posthuman

mythology gathers its imagery from actual information technology, using technology to build its own mythic world. The culture surrounding IT views IT as a means of conveying ultimate concern, and invests IT with ultimate significance by seeing within IT the answers to existential hopes. Information technology becomes the means by which the good life, value, and concerns for human destiny can be resolved. Though economics and engineering will be touched upon, this thesis is more concerned with how IT has captured the imagination of its sub-culture, and produced a cultural myth that functions as the foundation for an inauthentic theological model.

Summary of Argument

To this end, the first section of this thesis will begin in chapter one by exploring the early history of technology. The purpose of this chapter is to bring to the surface the need for a continual re-evaluation of technology within one's own era. Chapter two introduces technological essentialism and situates the topic within a philosophical trajectory that begins with the left-Hegelian interpretation of technology at the end of the industrial revolution and extends into the post-war critiques of the technological essence in the work of Heidegger, Ellul and Borgmann. It will be argued that contemporary philosophies of technology have promoted an implied essentialism which sees within technology a characteristic and unchanging essential nature.

Technological essentialism is the first of two key misunderstandings which contribute to the culture that surrounds contemporary information technology. This position need not be the exclusive purview of technological detractors, for even technological pundits commit technological essentialism. When pundits place their hope in the myth of technological progress, believing that technologies will continue to 'get better and better' over time until at last in some distant future technology becomes the principal means of attaining the ultimate satisfaction for human needs, such pundits alienate actual technologies from the essence of the reified Technology. Such a position is offered principally by the speculative scientists discussed in chapter eight. For those who see within technology a more nefarious essence, however, technological essentialism implies that technology constitutes a detrimental force which will continue to develop (for the worse) independent of human input. Accordingly, the potentially destructive nature of contemporary technology can never be successfully remedied. Essentialism in either form will be condemned as

patently false. As an alternative, in chapter three, it will be suggested that a more constructive philosophy of technology is one which situates human technical ability underneath the general auspices of human creativity. Chapter three will posit a hermeneutic-phenomenological approach to technology which places the onus of control and responsibility upon the individuals and societies which produce and use technologies. By asserting technology's material and cultural significance, and by arguing that technology's meaning can only be discovered at the nexus of its use and invention, a hermeneutics of technology argues that an ethics of technological practices must principally consider the users and developers of technologies. When critically examining the individual or society's implementation of technology, the question of 'appropriateness' becomes the uppermost concern for an ethics of technological practice.

In chapters four and five the focus of the thesis will turn from technology in general to the specific problems which arise from information technology. Chapter four will follow with a brief history of cybernetics and information technology, noting key trends and ideas that have contributed to this technology's development. It is hoped that by carefully describing the material history of information technology the tendency towards cybernetic totalism can be avoided. Chapter five will explore the specific ways in which the material history described in chapter four has been misconstrued in the philosophical, scientific and theological imagination. Thus, I will note how thinking about technology moves from a study of actual technologies (chapter four) to a reflection upon idealised technologies (chapter five) to a fictive or imagined perspective (section two).

In chapter five, leading to section two, it will be illustrated how the philosophy of technological essentialism, when applied within the context of the culture surrounding information technology, leads to what has been termed here 'cybernetic totalism'[2]. It will be argued that the myth

[2] I am borrowing this term from Jaron Lanier, "One-Half of a Manifesto: Why Stupid Software Will Save the Future From Neo-Darwinian Machines.," *Wired*, 8, no. 12 (2000). Journal Online. Available from http://www.wired.com/wired/archive/8.12/lanier.html?pg=1&topic=&topic_set=]. He argues that the term represents a belief that 1) Patterns of information provide the clearest way to grasp reality; 2) Individuals are in essence information patterns; 3) Subjectivity is purely illusory; 4) Darwinian

surrounding IT culture views IT as the means of purveying a more authentic model of reality when reality is mediated through computational analyses. For such IT pundits, the computer is treated as more than a tool used to accomplish a particular task, but becomes a means of conveying a more real understanding the 'real' world. Through mediation, representation, or simulation, computers are understood to unlock a greater dimension of reality than would have been available apart from digital representation.

It is the position of this thesis that cybernetic totalism represents a patently uncritical and naïve interpretation of actual information technologies. To counter cybernetic totalism, I will advocate subsuming the cultural appropriation of IT underneath IT's material and historical developments. I hope to dispel the myth that IT somehow conveys a metaphysically superior understanding of the real world, by anchoring IT within its own finite limitations. Certainly, computer modelling of complex systems has contributed a greater degree of understanding of the physical world in many areas of research. Nonetheless, it is a false assertion to argue that computers provide a clearer picture of *all* reality. Cybernetic totalism, following on from technological essentialism, invests IT with a level of essential value that promotes this technique as a foundational reality. It will be argued that cybernetic totalism uncritically and imprudently applies theories, models and methods of information and computing science in a way which exceeds the logical scope of such theories, models and methods.

Though on the surface IT may not appear to convey theological concern, within the history of IT and its surrounding culture there are indications of significant theological characteristics which have historically been overlooked by a majority of the academic theological community. As early as 1964, Norbert Wiener, a prominent 20th century cyberneticist, argued that cybernetics 'impinged' upon religion. The three principal points of convergence for Wiener were: 1) the creation of machines which can learn; 2) the creation of machines which can reproduce themselves;

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progressivistic evolutionary biology is the key to understanding all cosmic progress; 5) Moore's law regarding the exponential speed of computer processing capacity applies, at least in spirit, to all levels of technical development; 6) The biological and Physical world will merge with computer science resulting in the consummation of cosmic history.

and 3) the creation of machines which can engage in mixed-use applications, that is, machines which are integrated into social, cultural and biological life.[3] Despite his assertions, the impingement to which Wiener refers is not to religion or theology *per se* – nowhere does he argue that computers could themselves become or replace God, nor does he posit that they can or should become objects of veneration – rather, Wiener describes 'religious' impingement in terms of technology's potential ability to destabilise or challenge how subjectivity is traditionally understood within religion (and in the case of Wiener's definition of religion, the Judeo-Christian tradition). Wiener would argue that by destabilising traditional views of the subject, cybernetics or information technologies undermine many of the assumptions about self, world, and society which directly relate to the creation of a theological system. For Wiener, inasmuch as the doctrine of the *imago Dei* preserved the unique creative purview of the Divine (in relationship to humanity), by undermining human uniqueness, cybernetic technologies also undermine divine creative sovereignty. If humans are neither functionally unique (points 1 & 2) nor ontologically unique (point 3), for Wiener, the divine ceases to be magisterially unique in his creativity. Though this argument may seem somewhat crass, Wiener's *God & Golem, Inc.* represents an important step in the religious critique of contemporary information technologies. Namely, Wiener's work points to the common ground shared by theological-self knowledge and the self-knowledge derived from one's encounter with culture, and specifically, the culture made possible by human technology.

Wiener brings to the surface, a point which this thesis hopes to develop more fully. What inspires both laud and critique of IT culture is a concern over the possible self-sufficiency of technology, that is, that technology may somehow become authentic on its own terms. Fear of technology's self-authenticity is a nightmare that resounds in the familiar fictional world of Mary Shelley's *Frankenstein.* This paradigmatic tale orients our technologically inspired anxiety towards the source rather than the produce of technological creativity. It is not the technological objects which are the loci of angst, but the human creators and users of technology which serve as

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[3] Norbert Wiener, *God & Golem, Inc.: a Comment on Certain Points Where Cybernetics Impinges on Religion* (Cambridge, Mass.: The MIT Press, 1964), 11.

the principal points of worry. The true monster in *Frankenstein* was the creator not the created, pointing to humanity's hubris in usurping the creative sovereignty of the Divine. To apply Shelley's tale to Wiener, the principal concern is not that machines have or will replace God, but that humans by creating machines which are perceived to be human replacements, have as a result, lost their own place within the cosmos. Wiener's question might better be expressed by asking, 'When technology becomes human, what do humans become?' Either humans ascend to the role of the divine, or they are demoted to the status of beasts.

The heart of Wiener's religious concern centres on the cultural appropriation of technologies and the future of human creativity. To approach an answer we must both familiarise ourselves with the material and historical situation of technology (the general task of Section one) and also attend to the mythic worlds which a technologically engaged imagination envisions (the work of Section two). The stories which arise from human technologies engage the critical imagination in ways that allow commentators to reflect upon the present cultural appropriation of technology through an imagined future or alternative present. In order to advance a holistic critique of IT culture, this thesis must engage with both the actual technologies of engineers and inventors and the imagined or speculative technologies of theorists and dreamers. Following on from Wiener's concern that cybernetic impinges upon religion by altering perceptions of subjectivity, in the second section of this thesis the notion of the posthuman in science fiction and speculative science will be explored. I will argue that the posthuman is an imagined entity which is facilitated by cybernetic or information technology. Within the framework of a techno-theology, the posthuman is a symbol which functions as an object of eschatological significance.

As the bearer of ultimate significance, the myths told about technology within posthuman thought have abandoned actual technology and given way to imagined or speculative IT. This phenomenon will be discussed with reference to the posthuman appropriation of information technology in science fiction literature and film, strands of posthuman critical theory and cyborg-

feminism, and most significantly, speculative science.[4] The posthuman ethos correlates directly to the essentialist philosophy of technology and the cybernetic totalism which will be discussed in the first section of this thesis. The emphasis of this culture on the power of IT to facilitate a remedy for many of the existential needs of humanity, signals the emergence out from IT of a theological model which grounds theological concerns upon immanently realisable technological solutions.

As will be covered in full in chapter six, because posthuman themes are employed across a variety of subjects (e.g. film, fiction, and philosophy) there are a number of nuances in the term's definition that must be addressed. Three are worth noting here in the introduction. First, in film, fiction, or speculative science, posthumans are portrayed as the technologically empowered successors of present-humans. Within the filmic and fictional imagination, technologies are used to underscore the blurry-line between what separates the present-human from the posthuman (e.g. cyborgs, androids, or robots) thereby calling into question established notions of what constitutes *present*-humanity. With the speculative imagination of the sciences, the posthuman gives rise to a symbol of the human victory over finitude and death, where nanotechnology, bioengineering and information technology are viewed as steps towards the fulfilment of a very real posthuman destiny. A second understanding of the posthuman, not unrelated to the first, is used primarily within philosophy where the image of the posthuman in film and fiction is employed to critique what is termed the *Humanist* philosophical agenda. A Humanist philosophy argues for the priority of the individual as the autonomous centre of his/her own world, and paints the subject as one who is able to arrive at meaning and value based upon the unique nature of human reason. The posthuman response to Humanism argues that humanity has never been, nor will ever be, the centre

[4] It should be noted that although posthuman imagery and discourse does reflect postmodern concerns such as the loss of identity, the uncertainty of knowledge, and the unravelling of 'meta-narratives', what distinguishes the 'posthuman' from the 'postmodern' can be highlighted by an examination of the unique role played by technology in the posthuman imagination. Though 'postmoderns' will situate their philosophies within an era broadly called 'post-industrial,' the effect of post-industrial technologies is only a secondary concern, with the primary object of philosophical interest being the effect, not the cause, of the postmodern condition. By contrast, posthuman fiction and philosophy entirely depends upon technology to facilitate the creation of imagined or speculated posthuman entities. The cause and the effect of the posthuman condition are ostensibly conflated.

of its own self-created world. For the posthuman, humanity is constituted neither by reason nor divinely given superiority over nature. Instead, the human and the posthuman alike are seen as emergent beings which arise from complex webs of material and cultural sources; the definition of humanity is always open for constant reinterpretation. Posthuman theory, when seen as a critique of Humanism, understands human being and human destiny to be an emergent quality of culture and technology. Thirdly, when posthumanism is discussed within critical theory and strands of cyborg-feminism, the term can serve as an ironic symbol of gender re-identification and as a sign of human-technology co-emergence (as implied by the phrases techno-science, techno-nature, techno-culture, which are used frequently in such theoretical circles). For the posthuman theorist, the human-technology relationship is indicative of the whole of human cultural and biological evolution.

Chapter seven will examine the place of the posthuman imagination within science fiction literature and film, and notes fiction's use within posthuman theory and cyborg-feminism. In the examples from fiction and film that explore posthuman themes (what here will be termed 'posthuman fiction') the fictive imagination calls into question given assumptions about the unhindered use and proliferation of technologies. Although posthuman fiction plays an important role in providing a vocabulary for the critique of IT in certain strains of critical theory and cyborg-feminism, it is fiction's ability to prophetically critique technology that will, in the conclusion, prove to be a useful ally in making sketches towards a theology of technology. Fiction, unlike speculative science, uses posthuman imagery in order to challenge present-human assumptions about the nature and limits of technology, subjectivity, and culture. In so doing, it offers a forceful corrective to IT culture by engaging the imagination in the service of an ethics of technological practice.

In chapter eight, the posthuman imagination in science fiction will be contrasted with the faith in unhindered technological progress evinced by the so-called speculative sciences. Unlike fiction, rather than portraying imagined or theoretical technologies to critique contemporary IT culture, speculative science extends and accentuates contemporary actual technologies to their logical (or perhaps illogical) extremes. Within posthuman speculative science, an implied positivistic

futurism obscures productive or ethical uses of technologies and advocates the appropriation of technologies as quasi-religious conveyances of the ultimate.

In the conclusion of this thesis, the aforementioned appropriation of IT within the posthuman cultural sphere will be challenged by an appeal to what has been termed a theology of technology. This theology of technology will contrast with what in IT and posthuman discourse has broadly been an implied techno-theology of information, with what for our theology of technology will be a a kerygmatic theology of proclamation. The focus of proclamation will be the Word of God incarnate in the person of Christ as spoken of in the Christian Gospel. This is a preached word which is active and continually received and re-interpreted within community. It is a form of theological discourse which presupposes both an initial word spoken or lived, and a word which is received and absorbed by the church. It is no coincidence that I have chosen this kind of theological paradigm as the counterpart to information technology. But in what ways do the proclamation of the *kerygma* and purveying of information in IT relate?

As will be discussed in the conclusion, the distinction between the 'information' in information technology and the 'proclamation' in kerygmatic theology is a manifest difference in their relationship to creation and creativity. Technology, as will be described, often seeks to veil itself in the guise of authentic creativity where invention and innovation are mistaken for creation and creativity. Christian theology couches the idea of creation and creativity within the framework of salvation history and redemption. The creative, as a theological object, always points beyond itself to its foundation in the graceful giving of the Creator and, simultaneously, forwards towards a transcendent and eschatological image of redemption. Creation and creativity are therefore terms which have been endowed with symbolic importance which transcend (though in a sense also incorporate) human creativity. The sketches made towards a theology of technology at the conclusion of this thesis will inevitably point towards a return to the composite doctrines of creation and soteriology as a means of overcoming the idolatrous elevation of technology to the point of ultimate significance.

Information Technology and Ultimate Concern – a note on Method

The danger inherent to this thesis is that the philosophical, technological, and cultural details might appear to obscure what is at heart a theological matter. I believe that the culture surrounding information technology has elevated the potential of information technology to what theologian Paul Tillich would refer to as 'Ultimate Concern'. The quasi-religious theological model implied within the culture surrounding contemporary information technology will be deemed inauthentic when contrasted with an authentic theological model offered by Christian theology. The task of validating this assertion will be the general thrust of the thesis's argument. Before we can tackle the matter directly, however, a few words must be said about the theological method which is employed in support of this argument.

This thesis can generally be regarded as a theology of culture which dialogues with culture in areas where theology and culture offer divergent opinions regarding what constitutes ultimate significance. The project is unabashedly theological, inasmuch as it operates within the strictures of a kerygmatic theology. A kerygmatic theology argues that the knowledge of God is primarily revealed through the revelation of God in the message (*kerygma*) of Christ.[5] Though kerygmatic, this is a theology that is experienced through both the proclamation of the Gospel and the practices of the sacramental life. A kerygmatic faith stands in congress with the Augsburg confession, which promotes the *kerygma* as central to the life of the Church, which is defined as 'the congregation of the saints in which the gospel is rightly preached and the sacraments are rightly administered.'[6]

Although literally 'proclamation', the *kerygma* referred to in this thesis is not a reference to the preaching ministry of the church. Rather, I wish to employ a theology of the proclamatory

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[5] This is often contrasted (and I would add, unfairly) with a philosophical theology, implying that kerygmatic faith only requires a non-rational consent to belief in order for it to be practiced authentically. This is not the case with the understanding of kerygmatic theology argued for here, where the strictures of the kerygma – as handed down through traditions, creeds, confessions, and liturgies and mediated through communities, reason, and experience – are the particular experiences of a universal predilection for ultimacy, the unconditioned, or God. See also Tillich's engagement with Kerygmatic theology in: Paul Tillich, *The Protestant Era*, trans. James Luther Adams (Chicago: The University of Chicago Press, 1957), 83.

[6] *Augsburg Confession*, VII.

kerygma in order to address three central methodological issues which will be explored throughout this thesis: a) a *kerygmatic* theology points to the relation between transcendence and immanence; b) a *kerygmatic* theology engages with humanity within the particular and not merely universal; and finally, c) a *kerygmatic* theology points to the possibility of redemption through love.

First, the binary of transcendence and immanence is one which will continually be addressed in this thesis. Following from my reading of Tillich, the authenticity of a theological model will be judged in terms of a model's ability to convey an unconditioned (transcendent) absolute. Yet it is not merely enough to say that a theology of pure transcendence is preferable to a theology of pure immanence. Clearly, an incarnational Christian theology cannot afford to maintain such a rigid dichotomy. The theology of the *kerygma* points to the relationship between transcendence and immanence in the proclamation of the Gospel itself. Rather than preaching as such, I wish to highlight the transcendent nature of the *kerygma* which itself represents God's eternal presence in the world. Thus, we can say that the *kerygma* is not defined by preaching, but by presence. God, through the spoken and living Word of the *kerygma* continues to address the world as one who is immanently within the world though not contained by particular world-views or first principles. The *kerygma* is therefore a sign of God's transcendence and God's condescension.[7]

Functioning as the representation of both transcendence and immanence, the *kerygma* keeps humanity from searching for the full actualisation of the Divine being within the world. By retaining a belief in the otherness of the *kerygma*, a *kerygmatic* theology is a countermeasure against immanentist heteronomy. Yet by holding onto the belief that this transcendent word is within and for the world, a *kerygmatic* theology prevents a purely deistic turn within theological discourse.

Second, the *kerygma* is a message that appears within the particular social situations of the world today. Apparent though the antipathy between theology and culture may be, the preaching of (and adherence to) the *kerygma* need not imply either a neo-orthodox turn toward the Word or a

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[7] Helmut Thielicke, 'Outline of the Task of Proclamation', *The Evangelical Faith,* Vol. 1 (Grand Rapids: Eerdmans, 1974), 378 in Ray S. Anderson, ed., *Theological Foundations for Ministry* (Edinburgh: T & T Clark, 1999), 625.

'radical' orthodox turn toward the church as a flight away from a demonised secular. Helmut Thielicke tells us that the relationship between God and proclamation is the means by which one's concerns and questions are determined, giving one a form for how to speak about God in history and society, and a means by which one may understand reality in its relationship to God.[8] Accordingly, the *kerygma* is not merely a communiqué from God for the eyes of the church alone, but rather:

> The message of redemption is secular or it is nothing. It represents God in the world or it is sound and smoke. But to present God in the world does not mean equating him [with the World]....only that which transcends the world can make us worldly.[9]

The *kerygma* meets humanity within the unique structures of particular human situations, within the context of an ontic encounter with ultimate concern.

Appearing within one's own situation, the proclamation of the *kerygma* is always a proclamation which reminds the human hearer of God's 'promeity' – the message of divine redemption on behalf of humanity. It is within this ontic encounter with the *kerygma* that the *kerygma* points to the possibility of redemption through love. Within the particular situation of one's encounter with the *kerygma* we find the 'interpretation of the world from the standpoint of eternity' which confronts the 'pseudo-absolutes which are constantly being set up [by the world]' with the absolute that is derived through the *kerygma* itself – the absolute of love.[10]

Therefore, when throughout this thesis we encounter developments in technology, determine the relationship between technology and human hope, and find this hope manifested in the quasi-religious techno-theology of speculative science – it is through the lens of the aforementioned kerygmatic theology that my critique of IT culture proceeds. A theology of the proclamatory kerygma allows for a productive engagement between theology and culture, sheds light upon the relationship between transcendence and immanence (in theology and other human cultural

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[8] *Ibid.*, 625

[9] *Ibid.*, 634

[10] *Ibid.*, 631

pursuits), and points to the referent of this message in the absolute of divine love. God's love for the creation (inclusive of human technical abilities) necessitates a Christian theology of technology.

To bridge the gap between theology and culture, below I hope to address the following two methodological questions: 1) what constitutes religion or ultimate concern; and 2) what determines an 'authentic' theological model? To answer these two questions, I offer my reading of the later work of Paul Tillich. As this thesis is a *de facto* theology of culture, which seeks to engage Christian theology with the theology inherent within the culture surrounding IT, both Tillich's definition of religion – inclusive of its relationship to culture – and his theological method, are not without merit.

Religion as Ultimate Concern

In *The Protestant Era,* Tillich defines religion as 'the state of being grasped by something unconditional, holy, absolute,'[11] which earlier he calls being grasped by ultimate concern. A cautious reader should note that although certain similarities between 'ultimate concern' in Tillich and the description of religion as the feeling of 'absolute dependence' in Schleiermacher do share resonances, Tillich is adamant that his definition of religion is not to be read as the banishment of religion to some non-rational subjective sphere.[12] Religion may be expressed as the feeling of being unconditionally 'grasped', but the experience or encounter with ultimate concern implies the involvement of the whole person, neither feeling, intellect, nor reason alone. Furthermore, the personal dimension of being grasped is not to be viewed entirely distinct from the universal predisposition towards the ultimate which may be reflected in other cultural forms, outside established religious traditions. In order to clarify the tension between the universal and particular dimensions of ultimate concern, I would wish to frame the subject's encounter with the ultimate in terms of the Heideggerian distinction between the ontic and ontological. In Heidegger, the distinction between ontic and ontological (as well as, existentiell and existential) bespeaks the

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[11] Tillich, *The Protestant Era*, 58.

[12] Contrast: Paul Tillich, *Systematic Theology*, 3 vols., vol. 1 (Digswell Place, Welwyn, Herts, England: James Nisbet & Co. Ltd., 1964), 18 with Friedrich Schleiermacher, *The Christian Faith*, vol. 1 (New York: Harper, 1963), 12ff, 124.

distinction between the particularity of the former and the universality of the latter. In these terms, the ontic reflects the particular way in which B/being relates to *Dasein*, whereas the ontological reflects what Heidegger would call fundamental ways of being, of which the ontic and existentiell are both manifestations and foundations. For Heidegger, an analysis of ontology always begins first with the particulars of the ontic.[13] This implies, at least for the reading of ultimate concern advanced here, that the description of one's ontic encounter *with* ultimate concern reflects what is an individual and unique experience *of* ultimate concern. It is only subsequent to the ontic encounter that the ontological or universal element of ultimate concern can be described, inasmuch as the ontic (particular) encounter is both a manifestation of, and the logical foundation for, the ontological (universal) predisposition to search-out the ultimate which runs through all human culture and history.[14]

The ontic reading of ultimate concern implies that the definition of religion (as the encounter with ultimate concern) is not descriptive of an ontology of religion, but a phenomenological hermeneutic of religion. One's testimony to one's encounter is always first a statement of one's experience with ultimate concern and then subsequently an attempt to interpret one's experience through the hermeneutic advanced through one's context. To be ultimately concerned (ontically) is to be grasped by a form of concern which demands from the subject a total and utter surrender. Though experiential, one's encounter with ultimate concern is neither irrational nor non-rational, but could perhaps be better defined as meta-rational or supra-rational. It is considered supra-rational because though the expression of ultimate concern may supersede reason, it does not avoid or eschew either reason or reasonable explanation. It is furthermore the complete surrender of

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[13] Martin Heidegger, *Being and Time: A Translation of Sein and Zeit*, SUNY Series in Contemporary Continental Philosophy (New York: University of New York State Press, 1997), 11-15.

[14] Though we gather from Heidegger the language of the ontic vs. the ontological, The ontic encounter with ultimate would benefit from Ricoeur's reading of Heidegger's *Being and Time* and his critique of onto-theology. Ricoeur notes, following Heidegger that true religion is more than simply the pursuit of the being of life itself, but it is the sacrifice of life, the exteriorization of being, the birthing of one's true reality through the encounter of the abyss in selfless self-abandon. Paul Ricoeur, "Hermeneutics and the Critique of Ideology," in *Hermeneutics and Modern Philosophy* ed. Brice R. Wachterhauser (Albany: State University of New York Press, 1986), 417.

one's understanding of hope for the future, as the ontic engagement speaks to both one's present experience of being-in-the-world and to the entire sacrifice of one's being, through-time. Being grasped by ultimate concern is, in other words, the experience of a mode of being that is pregnant with the promise of 'ultimate fulfilment.'[15]

By describing religion as ultimate concern, religion can be understood as both the experience of a particular (ontic) religion and as the universal (ontological) proclivity for seeking ultimacy. In the particular, religion as a specific expression of the pursuit towards ultimate concern is mediated by and experienced within communities, organisations, hierarchies, texts, liturgies, theologies and other symbols of religious culture, wherein the Christian expression of the ultimate is but one of many.[16] In the more universal sense, ultimate concern can be represented by what John Caputo would call the passion for the 'impossible'[17] or what early-Tillich called the content of culture. Neither religion nor theology is the exclusive means by which ultimate concern is conveyed.

Modelling theology

If religion is the dimension of depth which underpins cultural concerns, of which theology is a paramount example, one could argue that a discussion of theology's authenticity is a discussion of a theological model's capacity to effectively mediate the depth to which it signifies. A theological model, to borrow from Ian Ramsey, is a metaphorical system whereby divine activity can be represented in intelligible terms through analogies that are common to human language. A model is an appeal to a kind of empirical analysis of theological language, which Ramsey hoped would reinvigorate theological discourse.[18] Sallie McFague argues that the use of models in theology (though an under-explored topic) leads theology away from the 'idolatrous' biblical literalism that has run rampant in late 20th century evangelicalism, to a form of theology that attends more

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[15] Paul Tillich, *Dynamics of Faith* (New York: Harper & Row Publishers, 1958), 2.

[16] Paul Tillich, *Ultimate Concern: Tillich in Dialogue*, ed. D. Mackenzie Brown (London: Harper and Row, 1965), 4.

[17] John D. Caputo, *On Religion*, Thinking in Action (London: Routledge, 2001), 3.

[18] Ian T. Ramsey, *Models for Divine Activity* (London: SCM Press, 1973), 1.

carefully to the significance of the Ultimate in the contemporary situation.[19] She encourages a metaphorical theology which, like Ramsey's use of theological models, upholds the model as a means of recovering a sense of sacramentality that is inherent within both language and existence. For McFague, 'the sacramental sensibility depends upon a belief that everything is connected, that the beings of the world are analogously related to God (Being-Itself) and hence can be sacramentally related to God'.[20] Modelling allows the reality that is represented by the model to correlate to its origin in the divine ground of being. This, she notes, is central to the very nature of human existence which is itself a model, a metaphor, an image of divine personhood:

> First, as we were made in the image of God (Gen. 3.27), so we now, with the model of Jesus, have further support for imagining God in our image, the image of persons. This means that personal, relational images are central in a metaphorical theology - images of God as father, mother, lover, friend, saviour, ruler, governor, servant, companion, comrade liberator, and so on.[21]

Recently, theological models have been addressed by David Klemm and his colleague William Klink. Akin to Ramsey who used models in theology to convey a more 'empirical' tone, yet in contrast to McFague who saw models as a means of giving theology a greater degree of resonance within all human language; Klemm and Klink see models as a means of achieving 'verifiability' within theological discourse. As discussed in their 2003 article in *Zygon: the Journal of Religion and Science,* their primary interest in modelling is to bridge the gap between the respectability of scientific discourse and what they see as the loss of credibility of theology in contemporary culture. For Klemm and Klink, 'models are not literal representations of physical nature but are constructed with full knowledge that they both reveal and conceal certain features of physical nature.'[22] Models are epistemologically humble accommodations to the limitations of knowledge which

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[19] Sallie McFague, *Metaphorical Theology: Models of God in Religious Language* (Philadelphia: Fortress Press, 1982), 24.

[20] *Ibid.,* 6.

[21] *Ibid.,* 20.

[22] David E. Klemm and William H. Klink, "Dialogue on Theological Models: Constructing and Testing Theological Models," *Zygon* 38, no. 3 (2003), 508.

'invite criticism and modification in light of their limitations. [Models] encourage their own undermining.'[23] Despite the contingency of their truthfulness, the process of positing and then refuting models seems to reveal a belief that models can become increasingly authentic, and thereby more truthful, through their continual re-formulation. One wonders if lurking behind their discussion of models is not a semblance of the myth of progress, as: 'the partial truth of earlier models is nested into the more encompassing truth of new more successful models.'[24]

In the use of 'theological models' advanced by this thesis, the concept will find greater resonance with Ramsey and McFague than Klemm and Klink. In particular, Klemm and Klink appear to treat models as theological accommodations to scientific epistemology, in order to give credence to theology in a sceptical secular age, rather than using models to acknowledge the sacramental or imaginative framework of universal human language. Furthermore, in their use of models Klemm and Klink appear to reduce theological discourse to a matter of pure epistemological consideration, thereby underplaying the significance of the ontic encounter between the theological modeller and the object of theological reflection. Though Klemm and Klink do note that theology's object is the very Tillichian 'being beyond being', other than asserting that there exists a common ontological foundation for both scientific and theological models, they make no accommodation for the ontic dimension of the individual theologian's engagement with his or her subject, apart from a mention of theology's critically self-reflexive interpretation of theological mythologies and sacred stories.[25]

Like Klemm and Klink, McFague notes that science, more readily than theology, employs models to explore its subject. She too laments the lack of imagination that this abeyance represents

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[23] *Ibid.*

[24] *Ibid.*. Furthermore, it would appear that theological models resist the same categories of falsification and verification which are endemic to scientific models. Theology is not verifiable solely on the basis of empirical tests, as theological discourse is not merely rational but meta-rational, encompassing a broad range of human experience and emotion, exceeding mere epistemology. Arguing for testability in theological systems appears to me to assert that theology is merely epistemological, and denies the ontic experience of theology as an encounter with ultimate concern, an not merely a critical reflection upon the nature of ultimate concern.

[25] *ibid.*, 510-12.

for the theological community.[26] Yet McFague does not encourage modelling only so that theology can become more respectable to a scientific community, or in order to provide a common form of language between science and theology. Rather, she pursues modelling because she regards the metaphor and the model as a central facet of all human discourse. To use metaphor for McFague is to be human.

McFague's position appears to draw from Ricoeur who would argue that models are to science what metaphors are to poetic language – both seek a means of re-describing reality in order to provider a greater degree of understanding.[27] Following from Ricoeur, in contrast to Klemm and Klink, McFague argues that models are less a means of authenticating a given discourse than are they a means of representing reality in a more intelligible way. Models represent what in theology is the exceeding of normal human language by the expansive subject of theological language. Ramsey's description of the model of presence, which correlates to the symbols of spirit, transcendence, activity and community, demonstrates how theological models are intended to explore the limitations of human language by inscribing the many points of correlation between a single theological concept and the representation of that concept in human life.[28]

Though models do provide us with a means of discussing the 'groundless-ground of being', we have yet to uncover an adequate means of differentiating between an authentic or inauthentic theological model. For this, we now turn to the description of what I have termed a post-critical method of correlation which seeks to read Tillich's tripartite division of culture (autonomy, heteronomy, theonomy) through Ricoeur's three-fold hermeneutics (naiveté, critique, second naiveté)

Towards an 'authentic' theological model

Even though the definition of religion proposed here does allow for the possibility that both culture and theology may function as co-mediators of ultimate concern, one is not without

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[26] McFague, *Metaphorical Theology,* 24.

[27] Paul Ricoeur, *The Rule of Metaphor*, trans. Robert with Kathleen McLaughlin and John Costello Czerny, SJ. (London: Routledge and Kegan Paul, 1977), 240.

[28] Ramsey, *Models for Divine Activity,* 51.

resources for judging the efficacy or authenticity of either religion or culture's ability to legitimately convey the ultimate. The task of determining what constitutes an authentic or inauthentic theological model is of great importance for this thesis, as it will be the fulcrum around which my judgment of IT culture will pivot. One way to determine the degree to which a cultural form authentically points to the ultimate, is by appealing to Tillich's rubric of the theology-culture relationship viz. the universality of ultimate concern as expressed in his analysis of autonomous, heteronomous, and theonomous cultures. In generalist and non-confessional terms his tripartite understanding of culture explores the degree to which culture (or religion/theology as a subset of culture) transparently reveals or opaquely conceals the ultimate which under girds it.[29] In the brief discussion below, I hope to illustrate the two means by which theology could judge the authenticity of a cultural form. The first will analyse a model's authenticity in terms of a cultural form's ability to efficiently point to the unconditioned. The second will judge a model's authenticity by an appeal to the specific affect of a theologian's own ontic encounter with ultimate concern through what will be called the imposition of the theological circle. The former method is a summation of Tillich's method of correlation and the latter is a sketch of what here will be called the post-critical method of correlation.

Authenticity as efficiency

The statement, 'religion is the substance of culture and culture the form of religion', is for Tillichian scholarship a hallmark for what constitutes a theonomous culture. Despite its almost aphoristic qualities, it is a statement whose meaning is unclear in its original context and is therefore liable to be thoughtlessly appropriated in careless scholarship. To understand Tillich's theology of culture, one must review his definitions of substance, content, and form, along with the

[29] Though later Tillich, especially within the lectures which make up the *Protestant Era*, sees his initial work on the theology of culture ["The Idea of a Theology of Culture", originally, "Ueber Die Idee einer Theologie der Kultur," in *Religionsphilosophie der Kultur: Zwei Entwurfe von Gustav Radburch und Paul Tillich* (Berlin: Reuther und Reichard, 1919), 27-52.] to have stemmed from an overly optimistic reading of the 'time' between the two world wars; his later reflections on the topic still adheres to the essential fruitfulness to this idea. Paul Tillich, *The Protestant Era*, 56.

terms autonomy, heteronomy and theonomy.[30] One of the clearest and most concise explanations of the first triad has been offered by Tillich scholar J. Heywood Thomas, who writes that form-content-substance should be defined as follows:

> The content of any culture is whatever happens to be the case at any particular time; but the substance of that culture is something that belongs not to the accidents of history but to the eternal nature of spiritual existence. Inevitably and necessarily that is given a form – and this in and by the content.[31]

Accordingly, for Tillich, ultimate concern exists as that which is underneath all cultural forms, though the degree to which the ultimate substance of a given cultural form is conveyed depends entirely upon the amount of substance (or depth) that is revealed by that given form. Significantly, according to this rubric, the so-called object of theology (God, the Unconditioned, the Ultimate) is not regarded as the exclusive object of theology, but is common to all cultural endeavours which seek to appeal to human existential need by pointing to something which is beyond. Basic human lack is the existential situation which pushes human being beyond itself to find fulfilment in something which appears to be ultimate.

For the thesis being argued here, such a definition of the religion-culture dynamic is of exceedingly great importance. It gives validity to the pursuit of a theological analysis of culture on the grounds that both theology and culture have a common concern, namely ultimacy. Thus, a theology of culture is not merely an exercise in clever interdisciplinary scholarship, but rather a necessary outworking of faith within the present age. Indeed, Tillich's initial vision for a theology of culture was one which regarded the theological-cultural analysis as a contemporary manifestation of theological ethics, which apologetically argues for the practical concerns of

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[30] Tillich's use of 'theonomy' (and the use which will be advocated here),differs from the standard definition of theonomy as a synonym for 'theocracy'. Though it is correct that the a theonomous culture does reflect the will, law, and desire of God (as the Ultimate), a theonomous culture is not a culture that is controlled (heteronomously) by a particular religion's understanding of divine law as imposed through civil law. A theonomous culture experiences the numinous as its groundless ground, and responds by living according to the spirit of theonomy.

[31] J. Heywood Thomas, *Tillich*, Outstanding Christian Thinkers, ed. Brian Davies, OP (London: Continuum, 2000), 36.

theology amongst the relevant cultural situation.[32] It is central to this thesis that a theology of culture provides both a means and a language with which theology can clearly identify the path towards what Tillich calls a theonomous culture, or what Christian theology would traditionally refer to as the Kingdom of God.[33] Both symbols signify a cultural sphere where an underlying ultimacy is made explicitly transparent.

If theonomy, or the Kingdom of God, symbolises the highest degree with which a culture reveals the ultimate, a heteronomous or autonomous culture represents in descending order the degree to which the ultimate becomes obscured. An autonomous culture is one which asserts that the individual, as the bearer of reason is the 'source and measure of culture and religion'. Secular autonomy within modern culture denies that humanity requires any ultimate ground and advocates the fashioning of a culture that is devoid of any reference to the unconditioned or transcendent.[34] Heteronomy, by contrast, decries the individualism implicit within autonomy and argues that in order for culture to have meaning, cultural creations must be subjected to systems of thought and action which are dictated to by externals such as 'ecclesiastical religion or a political quasi-religion.'[35] Yet unlike secular autonomy which denies the need for the ultimate, heteronomy acknowledges the possibility of ultimacy, but forbids the individual from pursuing it.[36] Theonomy, or a theonomous culture, combines aspects of the individualism of autonomy and the collectivism of heteronomy by acknowledging the presence of the ultimate and by expressing 'in its creations an ultimate concern and a transcending meaning not as something strange but as its own spiritual ground'.[37] Theonomy is the authentic conveyance of ultimate concern inasmuch as it a) recognises the possibility of a transcendent, and b) rightly considers the ultimate as the universal ground of

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[32] Paul Tillich, "The Struggle for a New Theonomy: On the Idea of a Theology of Culture," in *Paul Tillich: Theologian of the Boundaries* ed. Mark Kline Taylor (New York: Collins, 1987), 43-5.

[33] See: Paul Tillich, *Systematic Theology*, 3 vols., vol. 3 (Digswell Place, Welwyn, Herts, England: James Nisbet & Co. Ltd., 1964), 274.

[34] Paul Tillich, *The Protestant Era*, 56.

[35] *Ibid.*, 57.

[36] It should be noted that Tillich categorically favours either an autonomous or theonomous culture over a heteronomous culture. See: Thomas, *Tillich*, 35-7.

[37] Tillich, *The Protestant Era*, 57.

human being, thought, and action. It is akin to Jesus' parable in Matthew about the Kingdom of Heaven being like a treasure hidden in a field.[38] For both culture and theology, the true theonomy which the Kingdom of Heaven represents is hidden in the ground underneath our feet. Though, I would offer that the true power of this treasure lies not in the certainty of its actual existence (as a known foundation), but in our acknowledgment of the potential of its existence (as a contingent foundation).

It is important to reiterate, however, that theonomy is not synonymous with religion. Religion, as stated above, is the experience of being grasped by ultimate concern. When one's encounter with ultimate concern occurs within the context of a theonomous culture, this experience is authentically religious because the ultimate substance which under girds the cultural form is made apparent within one's ontic encounter with ultimate concern.[39] However, if the experience of being grasped by something which appears to be ultimate occurs within a non-theonomous culture, it is deemed an illegitimate expression of the religious predilection. It would seem that the universal proclivity to pursue ultimate concern only arrives at legitimate fulfilment if one's predisposal to the ultimate finds an expression within a theonomous culture. For example, if one experiences the drive to ultimacy within an autonomous culture (e.g. secularism), the pursuit of the ultimate is denied its ultimate significance by the culture's self-centred immanentism. Likewise, within the context of a heteronomous culture (e.g. nationalism or hyper-ecclesialism), the authentic experience of the ultimate is channelled away from the ultimate because such a culture asserts that ultimate concern can only be mediated through the structures of a particular ideology.[40] At stake

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[38] Matthew 13.44: "The kingdom of heaven is like treasure hidden in a field, which someone found and hid; then in his joy he goes and sells all that he has and buys that field."

[39] For Tillich, such a definition of religion is not necessarily individual. Ultimate concern is always mediated through cultural forms which are interpreted within community. For this reason, presumably, Tillich's Christian writings centred on the need to experience this grasping collectively within the church. After all, Tillich begins his systematic theology arguing for the centrality of the church as the locus of communal theological interpretation. Tillich, *Systematic Theology* 1.3.

[40] Tillich's description seeks to undermine an exclusively ecclesiastical definition of religion, asserting that religion is more than either exclusively ecclesiastical or emotional. Rather, it is a universal concern which gives 'meaning, seriousness, and depth to all culture.' (Tillich, *Protestant Era,* 59) Later

here is the tenet that ultimate concern must correspond with the dimension of depth within culture. It must relate to the underlying unconditioned which stands beneath cultural forms. Depthlessness, either in terms of rigid ideologies or the outright denial of depth (the denial of creativity, transcendence, etc.), is the antithesis of the theonomous culture.

When Tillich first introduced this threefold analysis of culture, his schematic mapped quite neatly onto the prevailing cultural forms of the early 20th century. His experience with German nationalism in the late teens and twenties and the capitulation of the national church to the will of the German state in the thirties, provided him with a clear example of the dangers of a heteronomous culture which misdirected ultimate concern to serve its own needs. Likewise, the autonomous culture of secularism was made apparent through his experience with the optimistic technological culture of the early 20th century which was expressed as a secular faith in the liberating power of new military technologies. It was particularly in his new home in the United States, that he observed how faith in the power of technology contributed to a nationalistic ethos. Additionally, autonomy was aided by the depthless faith of secularism which was brought about by the burgeoning culture surrounding newly created industrial and scientific technologies.[41]

Contemporary IT culture, however, is slightly more difficult to schematise in the way allowed for by Tillich's autonomous-heteronomous-theonomous rubric. Like autonomy, IT culture denies the presence of the truly unconditioned and seeks to satisfy ultimate questions with immanently realisable solutions. Following the ethos of technological essentialism, IT culture would assert that human lack can someday be overcome when future cultures possess sufficiently advanced technologies. Following the ethos of cybernetic totalism, IT culture would argue that any

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Tillich adds to this well rehearsed definition a note on the 'vacuum' (Tillich, *Protestant Era,* 60) in contemporary culture which has no space for ultimacy.

[41] See, for example: Paul Tillich, "The Logos and Mythos of Technology (1927)," in *The Spiritual Situation in Our Technical Society* ed. J. Mark Thomas (Macon, Georgia: Mercer University Press, 1988), 51-60; "The Technical Society As Symbol (1928)," in *The Spiritual Situation of our Technical Society* ed. J. Mark Thomas (Macon, Ga.: Mercer University Press, 1988), 179-84; 'Seven Theses concerning the Nuclear Dilema', *Christianity in Crisis* 21 (1961): 85-89; 'Nuclear Morality', *Partisan Review* 29 (1962): 311-12; *Systematic Theology*, 3 vols., vol. 3 (Digswell Place: James Nisbet & Co. Ltd., 1964), 81, 275-6, 294.

mysterious unknowns about the cosmos can be understood once culture achieves adequate computational power. Yet IT culture also appears heteronomous when it acknowledges a predilection for ultimacy and argues that ultimate concern can only find its fulfilment through technological means.

By either focussing the desire for ultimacy upon the immanent rather than the transcendent, or by outright denying the ultimate and suggesting in its place a purely material cosmology, IT culture reveals its antipathy towards theonomy. The use of technology to either substitute or avoid ultimacy and theonomy reveals a characteristic of this culture's use of technology. Technology becomes more than a tool placed in the service of a particular end, but serves as a means of protecting its users from the risks of finitude. There is no need to concern oneself with the limits of one's existence if culture provides adequate means of distraction and self-authenticating satisfaction. In the second section of this thesis, it will become increasingly clear that IT culture, typified by posthuman discourse, bestows upon IT an eschatological significance whereby technologies become the means of achieving what is incorrectly understood to be human authenticity.

In sum, IT culture offers an inauthentic theological model, because it denies the possibility of a theonomous culture. Tillich's term for this is the quasi-religious, which signifies a misdirected pursuit of ultimate concern which is 'directed towards objects like nation, science... society, or a highest ideal of humanity, which are then considered divine.'[42] Throughout this thesis, the specific manifestations of the quasi-religious culture of IT, as expressed chiefly through the posthuman discourse of the second section, will be termed 'techno-theology'. Like a quasi-religion, techno-theology seeks to direct its pursuit of the ultimate towards a particular object, which in the case of IT is either the technology itself or the symbols which emerge from these technologies.[43] The

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[42] Paul Tillich, *Christianity and the Encounter of the World Religions*, Bampton Lectures in America, 1961, vol. 14 (New York: Columbia University Press, 1963), 5.

[43] Though the object of Tillich's critique of quasi-religions is primarily communism, nationalism, or dogmatic ideology, he also makes note of the role of technology as a possible quasi-religion, though

pursuit of the ultimate in techno-theology is not a pursuit of the unconditioned, but merely a pursuit for what are regarded to be certainly attainable goals. As is consistent with Tillich's three principal observations regarding the quasi-religious, techno-theology reflects 1) a general religious indifference, whereby questions of existence are obscured by the depthlessness of a technological society; 2) the rise of technical creativity as a replacement of the relative freedom of religious creativity; and lastly 3) the reduction of religious symbols by their technical equivalents.[44] These points will be evidenced through the treatment of the posthuman ideology in chapters six to eight.

IT culture seeks to satisfy existential concerns such as the meaning of life, the source of value, the nature of community, and the nature of life after death – all aspects of what could broadly be called theological hope. Yet IT attempts to satisfy these concerns apart from any appeal to transcendence. The absence or presence of transcendence within a theological model appears to be the defining characteristic of what determines its authentic or inauthentic nature. All theology, whether authentic or inauthentic, seeks to answer existential questions which arise from the nature of the lived life. Yet, whereas an authentic theology seeks to provide answers that make an appeal to ultimate reality – which itself 'transcends the realm of the finite reality infinitely'[45]– inauthentic theologies (here, techno-theology), always point to themselves and nothing more.

Authenticity and the Kerygma: A Post-Critical Method of Correlation

Although one can judge a theological model's authenticity on the grounds of its ability to reflect ultimate concern, if ultimate concern is truly an ontic encounter that is interpreted through a hermeneutic phenomenology of religion, in order to successfully adjudicate a theological model's authenticity a confessional theologian must consider the particular nature of his/her own ontic commitments which are at work within the processes of judgment. The second means by which techno-theology will be deemed inauthentic will be by contrasting the immanentist hopes of techno-theology with similar hopes reflected in the Christian *kerygma*. To this end, where the

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he does not develop this theme in the referred to lectures. See: Tillich, *Christianity and the Encounter of the World Religions*, 12.

[44] Tillich, *Christianity and the Encounter of the World Religions*, 13-14.

[45] Paul Tillich, *Dynamics of Faith* (New York: Harper & Row Publishers, 1958), 44.

specific structures of Christian belief dictate what constitutes eschatological hope, soteriology, or the doctrine of humanity, these kerygmatic theological presuppositions will be preferred to alternative themes at work within IT culture. Though preferring one theological model over another may sound like non-rational fideism, I hope to describe such a faith as a post-critical faith which seeks to correlate the questions of culture with their answers in the Christian *kerygma.* Although I agree with St. Paul, who in Romans 8.24-25 says, 'Now hope that is seen is not hope. For who hopes for what is seen?', I also agree with Paul Ricoeur who states: 'The contrary of suspicion, I will say bluntly, is faith. What faith? No longer, to be sure, the first faith of the simple soul, but rather the second faith of one who has engaged in hermeneutics, faith that has undergone criticism, postcritical faith.' Post-critical faith is a faith-*in* what is unseen and also a faith that is *understood* by one's context. I believe that this kind of post-critical faith can serve as the foundation for what I advance as a post-critical method of correlation.[46]

If the *kerygma,* as the expression of one's ontic encounter with ultimate concern, is truly authoritative for the theologian's life, then his/her particular expression of ultimate concern would seem to result in both an ontic and epistemological effect.[47] In keeping with Tillich's language, this effect will be described by the term, 'theological circle', which is both a symbol for the *in-faith-ness* of the theologian and for the presuppositions which are required by theology's mystical *a priori.*[48] The theological circle both elucidates the epistemological criteria of confessional

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[46] Paul Ricoeur, *Freud and Philosophy* (New Haven: Yale University Press, 1970), 28.

[47] One is reminded of a similar theme discussed in the theological prolegomena (termed the 'theolegomena') in Robert W. Jenson, *Systematic Theology: The Triune God,* 2 vols., vol. 1 (Oxford: Oxford University Press, 1997). Jenson begins his project by noting the role played by the theologian's place in relation to theological proclamation determines the theologian's ability to accomplish the theological enterprise.

[48] Though only explicitly referred to in 'The Nature of Systematic Theology', the theological circle and the method it represents, has resonances throughout Tillich's body of work, particularly in his more occasional writings. See: Paul Tillich, "The Freedom of Science (1932)," in *The Spiritual Situation in Our Technical Society* ed. J. Mark Thomas (Macon, Georgia: Mercer University Press, 1988), 61-64; "The Person in a Technical Society (1953)," in *The Spiritual Situation of our Technical Society* ed. J. Mark Thomas (Macon, Ga.: Mercer University Press, 1988), 123-38; "Participation and Knowledge (1955)," in *The Spiritual Situation in Our Technical Society* ed. J. Mark Thomas

theology and hints at the ontic commitments which accompany a theologian's encounter with ultimate concern.

The post-critical method of correlation advocated here is distinct from other forms of correlational theology. One could argue that the theology of culture is akin to the task of theological interdisciplinarity. The pastiche attitude towards genre and disciplinary differences in postmodern culture and scholarship require the theologian to possess a clearly demarcated theological method which interprets the claims of Christian theology alongside similar claims made within culture. In the context of a purely *correlational theology*, one attempts to address, engage with, or even answer the questions posed by culture to theology with answers that theology sees either in itself or in culture. A *pre-critical method of correlation* argues that culture can only learn from theology and must bend its knee to the unique content of theology's message, closing off the possibility of the universality of the ultimate. A *critical method of correlation* argues that theology and culture are mutual partners which learn from each other in the free play of dialogue, but closes-off the possibility of the particular ontic encounter. A *post-critical method of correlation* attempts to hold in tension the claims to truth inherent in particular religious discourse, but also acknowledges, perhaps paradoxically, the universality of the quest for the ultimate within cultural forms.

Defining the Post-Critical Method of Correlation

To define the post-critical method of correlation, it is perhaps best to start by saying what it is not. Regarding the relationship between theology and culture, this method is neither dialectical nor neo-orthodox, dialogical, syncretistic, nor foundationalist/non-foundationalist. It differs from dialectic and neo-orthodox theologies, inasmuch as it denies that theology and culture are irreconcilable. Instead, it asserts that knowledge of God, so much as it is possible, is made universally available and is not the exclusive purview of the Christian religion. Though the post-

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(Macon, Georgia: Mercer University Press, 1988), 65-74; 'The Nature of Systematic Theology', *Systematic Theology*, 3 vols., vol. 1 (Digswell Place, Welwyn, Herts, England: James Nisbet & Co. Ltd., 1964), 11-38; 'Life and its Ambiguities' in *Systematic Theology III,* 'Thing and Self', and also to a lesser extent in the *System of the Sciences.*

critical method of correlation does acknowledge that it shares with culture a common pursuit for ultimacy, it is not a dialogical theology which views itself to be engaged in an egalitarian I-Thou conversation with culture. Instead, this method asserts that it is bound by the strictures of the Christian *kerygma* and the ontic and epistemological presuppositions which kerygmatic faith demands of its adherents. As a result, it places itself as a privileged partner within the dialogic event. In contrast to a syncretistic theological method, which seeks merely to blend theology with other modes of discourse, a theology of post-critical correlation embraces the contradictions and paradoxes which distinguish theological language from other forms of language, and is comfortable with saying that theological modes of knowing differ from other modes of knowing.[49] With respect to foundationalist and non-foundationalist theologies, this method argues that the epistemological extremes taken in both cases are incautiously optimistic regarding their position on the relative presence or absence of epistemological foundations. Though the post-critical method of correlation acknowledges that the texts, traditions, creeds, confessions and experiences of the Christian tradition make up the substance of the authoritative firmament of theological discourse, it asserts that they are not themselves the ultimate, but only point towards the truly unconditioned.

In Paul Tillich's later theological method, the particular situation of the theologian and his/her encounter with ultimate concern was described through a method of correlation where theology meets the existential questions of the world with the answers provided for by the Christian kerygma.[50] Managing the tension between theology and its other is the job of what Tillich refers to as the theological circle, which is both a symbol for the *in-faith-ness* of the theologian and for the presuppositions which are required by theology's mystical *a priori*. The theological circle both elucidates the epistemological criteria of confessional theology and hints at the ontic commitments which accompany a theologian's encounter with ultimate concern. Though rooted in Tillich's later theological method, my post-critical method of correlation has also gained significant insight from

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[49] See: Michael DeLashmutt, "Syncretism Or Correlation: Teilhard and Tillich's Contrasting Methodological Approaches to Science and Theology," *Zygon*, 40, no. 3 (2005), 739-50.

[50] Tillich, *Systematic Theology*, 1:59ff.

the interpretation of Tillich's method offered by other 20th century correlation-minded theologians – a few of note will be mentioned here.

Schillebeeckx's historical-critical theology correlates the Christian message with what he sees to be universally and historically evidenced 'constants' within human culture. Writing slightly after Tillich, he understands correlation to be the natural language of the church, which is ever attempting to describe in Christian symbolism the objects of concern which pre-exist in the world. He writes:

> But although they [world and church] are talking about the same thing, they are doing it from different points of view. That is why dialogue is necessary and why both the world and the Church, owing to the special contribution which each makes, need a two sided conversation about their work for the welfare of men...'[51]

For Schillebeeckx, the role of the church in society is not merely to correlate, but to prophesy. The church's ministry is, 'a role in which it is critical of society and at the same time socially utopian.'[52] Thus, Schillebeeckx advocates a new self-definition of the church's teaching office as the prophetic (that is, critical and constructive) power of the church to dialogue with the world. But for this prophecy to be applicable, the church must listen to both revelation and the 'foreign prophecy' spoken by the 'secular situation.'[53]

Informed by both Tillich and Schillebeeckx, Bernard Lonergan argues for a 'transcendental method' that takes into account the individual theologian's influence in the task of doing theology as a mediator between the matrixes of religion and culture. The task of correlating theology with culture or science is likened to a conversion, where conversion entails the mixing of horizons and the transcending of the self in light of another. For theology to dialogue with another subject or discipline, the other is necessarily converted in its contact with theology. It would seem theology too, changes and converts itself when made to engage with culture.

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[51] Edward Schillebeeckx, *God the Future of Man*, trans. N. D. Smith, Theological Soundings, vol. 5.1 (London: Sheed & Ward, 1969), 133.

[52] *Ibid.*, 136.

[53] *Ibid.*

Lonergan's methodology is taken up by Robert Doran in his expansive *Theology and the Dialectics of History*. Doran understands the principle thrust of Lonergan's work to have been a recognition of theology's radical transformation after its contact with natural science and the enlightenment. This is in slight contrast with what in Lonergan seemed to have been a conversion which primarily flowed in the opposite direction. Doran argues that Lonergan believed that contemporary theology existed in a new age which shook to the core the nature of theological theory and praxis. This meant above all else that theology was to be reconstructed, especially in terms of its ability to work alongside other fields and disciplines – in particular with the human sciences and hermeneutics. What Doran calls a 'dialectic of culture'[54] others like Schillebeeckx, Haight and Lonergan call a theory of correlation – a two sided dialogue where theology and its other learn cooperatively. Doran argues that despite the popularity of post-Hegelian synthesis *cum* correlation, theology is less concerned with dialogue than it is with systematisation. For Doran, theology is not a correlation, 'but an understanding of the realities named by both special and general categories, as these realities determine both tradition and the...situations...to be addressed...and...to be evoked.'[55] The principle problem which Doran sees in the method of correlation is that the concept allows for theology to draw from sources outside of scripture and the Magisterium, thus confusing the foundations from which theology is allowed to emerge.

> [I]t does not highlight the creative or constructive elements that make systematics a dimension of theology's second phase, where theology mediates from the present into the future. The term method of correlation is more congruent with a notion of systematics as interpretation than with the understanding of systematics as praxis mediation that informs the present work.[56]

For Doran, the method of correlation is bound to fail, as hermeneutics in his estimate, are unable to transform theology into the ongoing action of *praxis*. Moreover, according to Doran by prioritising the place of the theologian within a theological system, correlational theologies are too subjective

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[54] Robert M. Doran, *Theology and the Dialectics of History* (London: University of Toronto Press, 1990), 118.

[55] *Ibid.*, 453.

[56] *Ibid.*

and cannot account for the universal claims of theological proclamation.[57] As will be shown below, however, hermeneutics are precisely what allow theology to successfully maintain the tension of the theology-culture binary.[58] Indeed, Doran's preference for a systematic theology over and against a practical theology neglects the need for theology's correlational or conversational engagement with culture for the sake of theology's continued contextualisation.

David Tracy is among the most noteworthy redactors of late 20th century correlational theology. Tracy's method of correlation is often mistakenly read as being a more contemporary manifestation of Tillich's own work, although it is more in keeping with Lonergan's method than Tillich's method. For Tracy, rather than supplying the answer for the existential situation of the world (what late Tillich saw as the goal of a correlational theology), theology is constructed within its explicit connection with the world. He sees two principal sources (or poles) for theology: Christian texts and common human experience and language. Whereas Tillich attempted to correlate the questions arising from the situation with the answers provided by the Christian message (or 'texts', for Tracy), Tracy argues that 'only by a method which develops critical criteria for correlating the questions and the answers found in both the situation and the message' can the task of theology be adequately carried out.[59] For Tracy, Tillich's work is neither, 'intrinsically convincing nor consistent with the task of theology which he [Tillich] himself articulates.'[60] Tracy argues that Tillich's method is actually not a 'critical correlation' which results from one's 'investigations of the "situation" and the "message"', instead, 'Tillich's method does not actually correlate; it juxtaposes questions from the "situation" with answers from the "message"....the contemporary theologian can accept Tillich's articulation of the need for a method of correlation, but he cannot accept Tillich's own model for theology as one which actually correlates.'[61]

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[57] *Ibid.,* 456-7.

[58] For an exploration of the need for hermeneutics in a practical theology, see: Forrester, Duncan B. *Truthful Action: Explorations in Practical Theology*. Edinburgh: T&T Clark, 2000, 28-31.

[59] David Tracy, *Blessed Rage for Order : The New Pluralism in Theology* (New York: Seabury Press, 1975), 46.

[60] *Ibid.*

[61] *Ibid.*

Tracy's observation is partially correct. Tillich's method is inconsistently applied across the whole corpus of his work. Yet, Tracy unfairly prejudices himself against Tillich in light of the development of the theological circle in the first volume of Tillich's *Systematic Theology.* Whereas Tillich illustrates the ontic and epistemological influence of the theological circle, with respect to the theologian's encounter with ultimate concern, Tracy would dismiss any such privileging of the ontic encounter with ultimate concern over a general ontology of the universal religious predisposition. Tracy's analysis of Tillich, and subsequently Tracy's own theological method, is found inadequate when he makes theology and culture two equal poles within the correlational encounter. Such a fluid and unfixed theology jeopardises the constancy of theology's identity. There is no means by which a theology of culture could judge with any authority the authenticity of its own (or of culture's) relationship to theonomy.

Roger Haight, in his *Dynamics of Faith*, seeks to posit a form of critical theological reflection which forces the 'theologian' (whoever that may be) to correlate their own situation with the situation of the culture. His method of correlation is a fusion of Tracy and Tillich; taking from Tracy the language of the method of correlation and from Tillich the role played by religious symbols.[62] Haight, I believe, is a very helpful corrective to Tracy's method, because he reinforces theology's role as a practical expression of a particular encounter with faith.[63] For Haight, Christian symbols do not add knowledge to the world, but rather mediate the Christian's encounter with the transcendent. The theologian practices correlational theology by interpreting his encounter with the world through historical and contemporary manifestations of Christian symbolism. Thus, 'the method of correlation is not a method of theology, but the method of a discipline that seeks to preserve the meaning of the past but understand it in a distinctly present-day manner...'[64]

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[62] Roger Haight, *Dynamics of Theology* (Mahwah, NJ: Paulist, 1990), 195.

[63] Don Browning also provides a similarly a useful corrective to Tracy's critical method of correlation. See: Don S. Browning, *A Fundamental Practical Theology: Descriptive and Stragetic Proposals* (Minneapolis: Fortress Press, 1991).

[64] Haight, *Dynamics of Theology*, 192.

The various methods of correlation mentioned above,[65] all stem from Catholic re-interpretations of Tillich's protestant theological method. I believe that the examples of Schillebeeckx, Lonergan, and Haight, in particular, give credence to both the post-critical method of correlation advocated in this thesis. As an addition to Tillich's method, these Catholic theologians and their implied relationship to the Magisterium and the scriptures, offer what I see as a corrective to the overly-free practice of Tillich's method within his own work, which has contributed to the off-hand rejection of Tillich by the likes of Tracy. Catholic theology, with its reliance upon the traditions and strictures of the church, is far better suited to the restrictions imposed by the theological circle than is the relatively free theological milieu of protestant churches, as advanced by Tillich's so-called 'protestant principle'.[66]

Protestant theology, at least for Tillich, has an obligation to its reformation-roots to constantly call into question its own foundations Whereas only a more radical Catholic method of correlation would regard the correlational movement as a two-way dialogue between theology and culture (Doran and Tracy, for example), a more moderate Catholic theology regards correlation as an enterprise that stems from a certain degree of commitment to the Church (Schillebeeckx, Lonergan and Haight). The post-critical method of correlation aligns itself with the moderate Catholic method of correlation, but denies that this is a rejection of the protestant principle, or a reinstitution of a radical-orthodoxy-like ecclesiology. Instead, it is merely an acknowledgment of the epistemological affect of an ontic encounter with ultimate concern as mediated by the *kerygma*. The hermeneutic turn of the post-critical method of correlation allows Tillichian demythologisation to move into Ricoeurian re-symbolisation.

Epistemological Considerations

In terms of epistemology, the theological circle is a reflection of the presuppositions which the theologian brings into his/her engagement with theology. This is in contrast to what is the philosophical ideal of presuppositionless reason. Theologians precede their activity by assenting

[65] Unmentioned was Karl Rahner's theology which correlates the transcendental structures of the subject with the doctrines of revelation.

[66] Tillich, *Protestant Era,* 161ff.

to the 'criterion of the Christian message'[67] which undermines objective presuppositionlessness by bringing into the theological enterprise 'experience and valuation' which result from one's ontic encounter with ultimate concern. No matter how presuppositionless a theologian may seek to be in his/her analysis of culture, a theologian always brings to the table 'hidden theology', that is, theology which precedes rational discourse.

By bringing to the foreground the theologian's own place within theological thinking, the notion of the theological circle is able to explain the relationship within Christian theology between proclamation and a theologian's existential commitment to the mystical *a priori* of the kerygma. As noted above, to be in the theological circle is to be in a situation of faith. Theological method could be more accurately described as an analysis of *being* (being in relationship to the message, being in relationship to theology's other, etc.) than strictly an analysis of *knowing* (through induction, empiricism, or deduction). The act of doing theology or the state of being a theologian is essentially a task of ontic self-interpretation, which is to say, understanding one's own subjective situation in light of one's own encounter with ultimate concern. Tillich notes that, 'all theological statements are existential; they imply the man who makes the statement or who asks the question...The Theologian, in short, is determined by his faith.'[68]

The subjective involvement of the theologian in the theological enterprise places theological epistemology in a different context than the epistemology that is claimed by other types of academic discourse. This is a theme that is consistently raised by Tillich, especially in relationship to philosophy and the sciences.[69] The theologian engages in theological thinking by basing his/her presuppositions upon the *kerygma* and by orienting his/her conclusions to the answers which are

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[67] Tillich, *Systematic Theology*, 1:12.

[68] Tillich, *Systematic Theology*, 1:26.

[69] For further exploration of this theme, see: Michael W. DeLashmutt, "Syncretism Or Correlation: Teilhard and Tillich's Contrasting Methodological Approaches to Science and Theology," *Zygon*, 40, no. 3 (2005), 739-50.

anticipated in this selfsame message. This is theological 'circular' thinking in its most basic terms: the question is asked with the answer in mind.[70]

The ontic encounter

More than a metaphor for theological epistemology, the theological circle also highlights the space in which the theologian 'does' theology. Theology occurs in light of the theologian's ontic encounter with the person of Christ in the *kerygma* as a transformative and transforming experience which signals one's entrance into the theological circle. Tillich writes that the theologian 'enters the theological circle with a concrete commitment. He enters it as a member of the Christian church to perform one of the essential functions of the church – its self-interpretation.'[71] This self-interpretive move is made possible by the revelation of God in Christ, as spoken of by the *kerygma*, through the Spirit, in the Church. Self-interpretation is, as with Augustine's move towards reflexive interiority, a move of piety towards a greater degree of knowledge of God.[72] To be *in* the theological circle is to be 'in the situation of faith', to show an existential commitment to faith, and it is within this circle that the theologian attempts to engage with theology's other – outside of the circle. Though culture and theology may have as their ultimate 'object' the same unconditioned, the ontic encounter with ultimacy (under the auspices of the *kerygma*) implies for the Christian theologian that the theological circle is a boundary metaphor. It allows the theologian to consider

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[70] This is in contrast to the hope of Husserl's presuppositionlessness phenomenology. Husserl's phenomenology endeavoured to make philosophy a 'a rigorous science' which placed its attention solely on the 'things themselves'. This is not a turn to empirical knowledge, but rather a pursuit of foundations which would provide ultimate epistemological certainty. By bracketing the objective world by the *epoché* (a form of reduction), the philosopher's gaze can be set upon that which is nearest to consciousness itself, thereby eliminating all presuppositions regarding an object. See: Husserl, *Ideas*, 95-105; Husserl, *Cartesian Meditations*), 11-23; and Paul Ricoeur, *Husserl: an Analysis of His Phenomenology,* ed. John Wild, *Northwestern University studies in Phenomenology & Existential Philosophy* (Evanston: Northwestern University Press, 1967), 20.

[71] Tillich, *Systematic Theology*, 1:12.

[72] For further exposition of this point, see: Michael DeLashmutt, "Augustine's Quest for the Self: a Threefold Journey," *eSharp*, 1, no. Spring (2004).

the ultimacy that under girds other intellectual and cultural pursuits, but prohibits those pursuits from becoming normative or ultimately authoritative for theology.

> The theologian as theologian is no expert in any matters of preliminary concern. And, conversely, those who are experts in these matters should not as such claim to be experts in theology. The first formal principle of theology, guarding the boundary line between ultimate concern and preliminary concerns, protects theology as well as the cultural realms on the other side of the line.[73]

For Tillich, if a Christian theologian transitions beyond the circle, s/he becomes a philosopher of religion among other philosophers. S/He is then bound by a different set of methodological rules, lexica, and conventions of reason and thought. S/He has gone beyond the borders of theological discourse, and can only engage in discourse with a philosopher as a fellow-philosopher and not as a theologian.

> The "scientific" theologian wants to be more than a philosopher of religion. He wants to interpret the Christian message generally with the help of his method. This puts before him two alternatives. He may subsume the Christian message under his concept of religion. Then Christianity is considered to be one example of Religious life beside other examples...Such a theology does not enter the theological circle.[74]

In light of the ontic commitment to the *kerygma* which results in the *a priori* theological epistemology, the theologian is faced with a problem of how to engage in dialogue with theology's other, while remaining ostensibly within the theological circle. One could object that one cannot successfully engage in dialogue when one comes to the table with a solution already in mind. Yet, within Tillich, the matter of relating culture and theology rests on an implied understanding of hermeneutics. One must recognise the ultimate unity which under girds the multiplicity of cultural forms which in turn reflects this unity. Accordingly, there is no essential conflict in the division between the ultimate (substance) and preliminary (forms). Theology can still dialogue with cultural forms such as poetry, arts, film, music, science and technology, but theology can only speak about these forms when they are used to convey 'some aspects of that which concerns us

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[73] *Ibid.,* 1:15.

[74] *Ibid.,* 1:13.

ultimately.'[75] With this caveat in mind, the theologian can then turn his/her attention to these objects, but only from the perspective which regards first, the ultimate/infinite which is underlying these penultimate and finite objects.[76] By retaining a commitment to the ultimate as experienced through the kerygma, the theologian can speak about the numinous which is revealed in philosophy, the sciences, and culture; while still remaining within the theological circle.

> The analysis of the human situation employs materials made available by man's creative self-interpretation in all realms of culture. Philosophy contributes, but so do poetry, drama, the novel, therapeutics psychology, and sociology. The theologian organises these materials in relation to the answer given by the Christian message. In light of this message he may make analysis of existence which is more penetrating than that of most philosophers.[77]

The method described above, with its emphasis on the epistemological constraints of the ontic encounter with the *kerygma*, may appear to be nothing more than a return to fideism, or at worst, a reinstantiation of the pre-Tillichian theonomy as a cipher for theocracy. To be sure, similarities in language make the above method seem foundationalist or even fundamentalist, but it is my hope, in this final comment, to dispel these illusions. In a post-critical method of correlation, the epistemologically affect of the ontic encounter with ultimate concern, can be best expressed through a theological hermeneutic.

The elevation of the ontic and its epistemological affect is a move towards a second naïveté, where one is challenged by a return to the power of a symbol, having moved first through a critique of this symbol's originary foundationalism. At the heart of the matter, the task of this post-critical method of correlation will primarily be to determine how one interprets the different kinds of language being employed by theology and its other, with respect to the presuppositions which underlie such language. At this point, Paul Ricoeur's introduction to *The Symbolism of Evil* may prove helpful in unpacking the nature of philosophical and religious discourse. Rather than establishing what appears to be an epistemological hierarchy ordered by the acceptance or rejection

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[75] *Ibid.*, 1:16.

[76] *Ibid.*, 1:16.

[77] *Ibid.*, 1:71.

of presuppositions, Ricoeur insists that all discourse is inherently presuppositional. Speculations, myths and symbols contribute to the promulgation of any dialogue, whether theological, philosophical or scientific. It is in reading through and with our presuppositions that we can arrive at meaning. Theological interdisciplinarity (defined as the task of doing theology in a postmodern world) becomes a matter of hermeneutics.

The Symbolism of Evil follows after Ricoeur's philosophical anthropology, *Fallible Man*, and explores the possibilities of – and reasons for – human evil. A phenomenology of sin, guilt and confession may appear to be an unlikely component for what is a purely philosophical dialogue; yet I believe that Ricoeur employs these symbols in order to explicate what is in essence an issue of philosophical methodology. Discussing sin in the context of religious language requires a philosopher to consider the nature of myth, a concept whose efficacy, according to Ricoeur, increases over time:

> Myth will here be taken to mean what the history of religions now finds in it; not a false explanation by means of images and fables, but a traditional narration which relates to events that happened at the beginning of time and which has the purpose of providing the grounds for the ritual actions of men of today and, in a general manner, establishing all the forms of action and thought by which man understands himself in his world. For us moderns, myth is only a myth because we can no longer connect that time with the time of history as we write it, employing the critical method, nor can we connect mythical places with our geographical space. This is why the myth can no longer ban explanation; to exclude the etiological intention is the theme of all necessary demythologisation. But in losing its explanatory pretensions the myth reveals its exploratory significance and its contribution to understanding, which we shall later call its symbolic function – that is to say, its power of discovering and revealing the bond between man and what he considers sacred. Paradoxical as it may seem, the myth, when it is thus demythologised through contact with scientific history and elevated to the dignity of a symbol is a dimension of modern thought.[78]

Ricoeur tells us that in today's world, myths can no longer be engaged with as primal-explanatory tools. In an age following the demythologising project of Bultmann, et al., one is faced

[78] Paul Ricoeur, *Symoblism of Evil*, trans. Emerson Buchanan (Boston: Beacon Press, 1967), 5.

with an obligation to approach 'dead' myths not as simple historical-sociological detritus, but as notions which through their demythologisation and critique have been metamorphosed from explanatory myths to exploratory symbols. As exploratory rather than explanatory, the symbol can be employed even after the myth has been denuded of primal import. By advocating the power of the symbolic which is elsewhere described in terms of the ontic power of narrative,[79] Ricoeur arrives at a position which can be explained in the Tillichian language of this thesis as an encounter with ultimate concern. The myth as symbol is enabled to express the ultimate because its narrative particularity conveys universally applicable meaning.[80]

To be grasped by the *kerygma* in a way which leads to Ultimate Concern, is to read one's encounter with the symbolic through a particular kind of hermeneutic. The semiotics proposed here by Ricoeur are described as a pursuit of 'a full language', which is a language that takes into account – from the first instance – the multiple layers through which discourse proceeds. Meaning emerges through the matrices of myth, symbol, and speculation, implying that a *full* language is an acknowledgment of the hermeneutic depths and detours through which meaning is allowed to arise. The progression of interpretation is described by Ricoeur as occurring in the 'hermeneutic arc'. The arc consists of three phases which are plotted synchronically (horizontally). The first is an innocent act of primal understanding, where one arrives at the meaning of a text without reflection. The second stage is explanation or critique, where the text is torn open and the original meaning is

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[79] The place of narrative as that which constitutes the self, temporality and sociality can be explored widely in his corpus. For further reading see: Ricoeur, Paul. *Fallible Man.* New York: Fordham University Press, 1986; *Figuring The Sacred: Religion, Narrative, and Imagination.* Minneapolis: Fortress, 1995; "Freedom in the Light of Hope." *In Essays on Biblical Interpretation,* ed. L. S. Mudge, 155-82. Minneapolis: Fortress Press, 1985; "The Human Experience of Time and Narrative." In *A Ricoeur Reader: Reflection & Imagination,* ed. M. J. Valdes, 99-116. London: Harvester Wheatsheaf, 1991; *Oneself as Another.* Chicago: University of Chicago Press, 1992;"Preface to Bultmann." *In Essays on Biblical Interpretation,* ed. L. S. Mudge, 49-72. Minneapolis: Fortress Press, 1985;*Time and Narrative.* Chicago: University of Chicago Press, 1988; "The Antinomy of Human Reality and the Problem of Philosophical Anthropology." In *Readings in Existential Phenomenology,* Eds. N. Lawrence and D. O'Connor, 390-402. Englewood Cliffs: Prentice-Hall, Inc., 1967.

[80] Ricoeur, *Symbolism of Evil,* 6.

obscured in light of analysis. The third and final movement is towards am informed understanding which is termed (variously as) the second naïveté. Meaning bubbles-up from the three points of interpretation as one's re-appropriation of the original import of a text is repeated and made authentic through the act of suspicion, critique and reflection.[81] For Ricoeur, how I encounter a text (a set of doctrines, a person, a self, the world) proceeds through these three levels.

Whereas Tillich's theological circle is made contingent upon the presuppositions of the mystical *a priori* of the Christian kerygma, Ricoeur's hermeneutic arc explores how the interpretation which arrives at meaning-bearing symbols only can emerge in the context of the presupposition-laden nature of all forms of discourse. If all discourse proceeds from one level of interpretation to the next, it is clear that presuppositionlessness is pure fallacy.[82] Meaning develops through critique. Because any given text is capable of bearing a progressively escalating meaning, we come to what Ricoeur defines as the 'surplus of meaning' which indicates that a given symbol is able to connote meaning which, as exploratory, goes beyond the boundaries of its original form. This meaning comes through, not in spite of, presuppositions. The mediation of symbols through one's presuppositions is necessary for meaning.[83] Therefore, Ricoeur's insistence upon a narrative epistemology ostensibly levels the playing field between theology and its correlational counterpart by insisting on the necessity of presuppositions.

Applied within the post-critical method of correlation, the power of the Ricoeurian-symbol as meaning-bearing symbol bespeaks one's place within the theological circle. Being in the theological circle implies living under the enfluence of the symbolic which marks off one's place within a progressively interpreted narrative. In other words, to be in the circle is to be grasped by the transforming power of re-invigorated myth. Hence, it becomes clear that for theology to

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[81] The arc is described in the *Time and Narrative* trilogy as the 'mimetic arc'. The three corresponding stages are prefiguration, configuration, and refiguration. The best description of any of Ricoeur's arcs (and their relationship to each other) can be found in: Dan Stiver, *Theology After Ricoeur: New Directions in Hermeneutical Theology* (Lousiville: Westminster John Knox Press, 2001), 56-78.

[82] Ricoeur, *Symbolism of Evil,* 18.

[83] *Ibid.,* 348.

dialogue with its other, it must adopt a stance which regards all language as presuppositional and seek to read through prepositions in the pursuit of meaning.

As with Tillich's theological circle, Ricoeur's hermeneutic arc is both a facet of his epistemology and concomitant with his ontology. Living experience, according to Ricoeur, 'is abstract, in spite of its lifelike appearance....experience is never immediate; it can be expressed only by means of the primary symbolisms that prepare the way for its treatment in myths and speculation.'[84] To exist is to interpret and existing within the theological circle is existing within hermeneutics. Ricoeur's hermeneutic arc has as its terminus and *telos* the second naïveté, which is an intentional return to naïveté with regards to a text. It would seem then, that the Christian theologian can be understood as one who is intentionally situated under the message of the *kerygma*, making the mystical *a priori* of the Christian message foundational for his or her being.

If we read one's commitment to the *kerygma* as an assent to a second naïveté, the movement between the worlds within and out-with the theological circle can be regarded not as an irredeemable bifurcation of the sacred and the profane, but as a part of the distinct elements of the subject's encounter with varying dimensions of life. Moving between the boundaries of the circle in this regard facilitates sympathetic discourse with parties outside the circle's perimeter. This is for Ricoeur, perhaps the only response which religion has in the face of demythologisation. He writes:

> In every way, something has been lost, irremediably lost: immediacy of belief. But if we can no longer live the great symbolisms of the sacred in accordance with the original belief in them, we can, we modern men, aim at a second naiveté in and through criticism. In short, it is by interpreting that we can hear again. Thus it is in hermeneutics that the symbol's gift of meaning and the endeavor to understand by deciphering are knotted together.[85]

The point of the second naiveté, the return to the first reading of a text, is to arrive at the symbolic meaning of the myth through the critical gaze. Myth as religious language becomes

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[84] *Ibid.*, 10.

[85] *Ibid.*, 351.

meaningful once again after the symbols are resurrected anew from the grave of criticism. Therefore, mythic language has meaning to those who seek meaning within it: *credo ut intelligam* – I believe that I might understand. The hermeneutic arc, much like the presupposition-laden theological circle, comes to belief seeking understanding, comes to understanding seeking belief. The presuppositions make possible the assent to faith, the assent to interpret.

> The second immediacy that we seek and the second naiveté that we await are no longer accessible to us anywhere else than in a hermeneutics; we can believe only be interpreting. It is the 'modern' mode of belief in symbols, an expression of the distress of modernity and a remedy for that distress.[86]

The Second Naïveté in the context of the theological circle is a post-critical assent to belief in original symbols – a commitment to read these symbols through critique in the face of radical doubt – and a challenge to allow the meaning of these symbols to dictate one's experience of reality.

Conclusion

In what follows in this thesis, I will critique what has been described here as the bankrupt nature of techno-theology by placing it into dialogue with the surplus of meaning that is found in kerygmatic theology. Having attempted in this introduction to outline the course of the following argument and to establish the theological method which will be operating in the background of this thesis, we now move to an exposition of the explicit theological model offered by the techno-theology implied in the culture surrounding information technology. To review what has been said so far, information technology gives rise to symbols which serve as objects of theological hope. Though these symbols point towards the satisfaction of existential human needs (the good life, the betterment of society, and the end of finitude) the symbols arising from IT culture have as their object, immanently realisable technical solutions to these desires. As a theological model, techno-theology is inauthentic because in attempting to point to the ultimate, it fails to orient its theological discourse beyond itself. In contrast to kerygmatic theology, the eschatology,

[86] *Ibid.*, 352.

soteriology, or doctrine of humanity purveyed by IT culture contrasts with the same doctrines in operation within Christian faith, and are therefore judged inauthentic on the grounds that they fail to point towards genuine transcendence. They offer a 'factual' form of signification for what in authentic theology is a faith in the symbol of the Ultimate.

In what follows, the key philosophical assumptions which under gird the techno-theology of IT culture, technological essentialism and cybernetic totalism, will be explored and deemed insufficient. In their place, I will advocate a hermeneutic reading of technology and a realistic historical-critical appraisal of information technology. Following this, the specific nature of IT culture will be examined using examples from fiction, film, and speculative science. Having discussed the points of contrast and confluence between kerygmatic theology and techno-theology, this thesis will conclude by making sketches towards a theology of technology.

Section I: Philosophical, Historical and Material Considerations

Within this section, the problems of technological essentialism and cybernetic totalism will be discussed and critiqued. Chapters 1-3 will specifically address the historical and philosophical foundations of technological essentialism and provide an alternative in the form of a hermeneutic philosophy of technology. As stated in the introduction, technological essentialism imbues technology with a characteristic and unchanging essential nature, whereby technologies can receive no substantial challenge or corrective. For those who regard the technological essence as benign, this philosophy implies that technologies will continue to improve through time, allowing technology to become a means of attaining the ultimate satisfaction for human needs. For those who see in technology a more nefarious essence, technology is regarded as a detrimental force which will continue, per its essence, to undermine value and culture. It is the goal of this section to demonstrate that technological essentialism, in either its positive or negative forms, is an untenable philosophical position.

Technological essentialism, when applied within IT culture, leads to cybernetic totalism. In chapters 4-5 cybernetic totalism will be addressed by an appeal to the material and historical antecedents to contemporary information technology and through an examination of the treatment of information technology within contemporary scientific, philosophical and theological discourse. Here, cybernetic totalism will be defined as the propensity to see within cybernetics (or information technology, more broadly) a better or 'more real' model by which one can understand the world. It will be demonstrated that the reductionistic and overly positivistic appropriation of IT within cybernetic totalism is rooted in a misconstrued understanding of IT.

Chapter 1: Understanding Technology

Introduction to the Study of Technology

Human culture is bound up with human creativity. For H. Richard Niebuhr, 'Culture...is *human achievement*....distinguish[ed] from nature by noting the evidences of human purposiveness and effort.'[1] Niebuhr recites a litany of culture/nature distinctions (rivers are nature, whereas canals are culture; quartz is nature, arrowheads are culture; a moan is nature, words are culture, etc.) and concludes that culture is the work of human minds and hands, encompassing speech, education, tradition, myth, science, art, philosophy, government, law, rite, beliefs, inventions, and technologies. Culture is something which humans strive to create and maintain: languages are learned, governments are established through effort and revolution, scientific method is continually refined, and tools are engineered and re-engineered to suit a specific situation. More specifically, individual cultures or sub-cultures consist of groups of individuals who adhere to a shared collection of texts and/or practices. Texts can include any manner of artefact, including the arts, film, media, literature, music, fashion; and practices can be any shared behaviour such as religion, politics, governance, sport, recreation, entertainment and commerce.[2]

IT culture can be defined as its own sub-culture because it possess common texts (artefacts, fiction, film, theory and philosophy) and practices (computer use for gaming, work, education, and communication) which distinguish it from the rest of so-called 'mainstream' culture. If this thesis is to engage seriously with the culture surrounding information technology, it must first attempt to identify two things: 1) what precisely is *technology*? and 2) how has technology been historically understood? Answering these questions hints at the philosophical, historical and material situation from which our understanding of IT culture can emerge. Like any hermeneutics, in order to interpret our subject we must attempt to situate it within a given context. This chapter will seek to answer these two situational questions, by providing a brief introduction to the study of technology.

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[1] H. Richard Niebuhr, *Christ and Culture* (New York: Harper Brothers, 1951), 33.

[2] Gordon Lynch, *Understanding Theology and Popular Culture* (London: Blackwell, 2005), 93ff

Even though this thesis is primarily concerned with the theological implications of what is specifically 'Information Technology', it is necessary to pursue an understanding of technology in general before one attempts to understand this particular subset of technology, in order to better familiarise oneself with the broader context of the discussion.

Despite what has been argued already regarding the importance of engaging seriously with material culture and technology, technology is a topic that is often overlooked within philosophical or theological discourse. In *Autonomous Technology: Technics-out-of-Control as a Theme in Political Thought*, Langdon Winner addresses the general neglect which technology has suffered in modern social and political thinking. He writes:

> [T]echnology itself has seldom been a primary subject matter for political or social inquiries. While technological developments are commonly cited as among the most important causes of the shape of modern society, the tendency has been to see the matter solely in terms of economics and economic history, perspectives that due to their special mode of abstraction and selectivity give us a very limited vision of the role technics have played in modern history.[3]

In contemporary philosophy, the study of science as a philosophical object (e.g. the philosophy of science) has produced keen analyses of how science and scientism affect and challenge pre-philosophical and philosophical epistemologies, cosmologies and metaphysics. In theology, the study of science is represented by the well-trodden ground of the science-theology dialogue, which especially since the late 19th century has endeavoured to explore the apparent conflicts between scientific cosmologies and anthropologies and the theological belief in human distinctiveness, creation, divine action, miracles and the like. Despite inroads into the study of science-and-philosophy and science-and-theology, it is curious that the philosophy of science and the science-

[3] Langdon Winner, *Autonomous Technology: Technics-Out-Of-Control As a Theme in Political Thought* (London: MIT Press, 1992), 2.

theology dialogue have historically neglected the role played by technology in shaping the modern world.[4]

The relative absence of serious engagement with technology in either discipline is fuelled by what Philosopher of Technology Don Ihde terms the three '*prejudices*' which have influenced the dominant mode of discourse within the philosophy of science (and, I would add, the science-theology dialogue as well). The first and most ancient prejudice is the 'preferencing' of science (as theory) over technology (as practice). This anti-practical bias leads in more modern times to the positivistic tradition of a technology-free science, a type of science which is so pure and so perfect that it can do without empirical verifiability or technological mediation. The second prejudice, a position which has been voiced in contemporary discourse in Lewis Mumford's *The Myth of the Machine,* argues that modern technology fundamentally differs from traditional technologies, noting that it is a false assumption to 'identify tools and machines with technology'[5] The third and final prejudice is the belief that modern technology has 'been *largely derived from Modern Science,*'[6] a position which further sublimates technology underneath the sciences, and makes the discipline a mere footnote to discussions of applied science.[7] Along these three lines, technology is either ignored because it is too homely, disregarded because it is too new or too reified, or

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[4] This is, of course, with the exception of Ian Barbour's excellent, *Ethics in an Age of Technology* or Philip Hefner's concise *Technology and Human Becoming*. With respect to the popular study of technology in relationship to religion, David Noble's, *The Religion of Technology* is also worth.

[5] Lewis Mumford, *The Myth of the Machine: Technics and Human Development* (London: Secker & Warburg, 1966), 4.

[6] Don Ihde, *Philosophy of Technology an Introduction*, Paragon Issues in Philosophy (New York: Paragon House, 1993), 20.

[7] The popular and erroneous notion that modern technology is derivative of modern science has been challenged by a number of theologians and philosophers during the previous century. Paul Tillich, for example, notes that it would appear that the sublimation of technology under the sciences is not due to historical fact or even an ontological precedent, but because of the prevalence of the 'Greek ideal of theory' which through the Humanists, 'never allowed the actual rank of the technical sciences to be recognised.' In contrast, 'the real attitude of the modern Western spirit is undoubtedly that the technical sciences are the proper end of scientific endeavour.' Paul Tillich, *The System of the Sciences According to Objects and Methods*, trans. Paul Wiebe (Lewisburg: Bucknell University Press, 1981), 102.

overlooked because it is merely a derivative of the modern scientific age. In reaction against this trend, proper philosophies of technology have emerged over the course of the last 150 years which have attempted to elevate practical and technological knowing to a place at least equal to theoretical knowing.

To be sure, despite its neglect there still exists a significant and important body of work on the subject of technology. Especially within existential theology and theological ethics,[8] technology has actually received a considerable treatment. In the previous century, Paul Tillich showed an expansive interest in technology, both in terms of its relationship to the sciences and regarding its social and political dimensions.[9] Christian bio-ethicists have also shown an interest in the role played by technology in the curative and palliative care of patients and with respect to the rights of access to medical technology.[10] Likewise, Christian thinking regarding the environment has shown a pointed understanding of the ambiguously destructive and creative power of technology's use, in

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[8] In addition to religious minded social critiques of technology. See: Albert Borgmann, *Technology and the Character of Contemporary Life: a Philosophical Inquiry* (Chicago: The University of Chicago Press, 1984); Jacques Ellul, *The Technological Society*, trans. John Wilkinson (London: Jonathan Cape, 1965); Lewis Mumford, *The Myth of the Machine: Technics and Human Development* (London: Secker & Warburg, 1966); Neil Postman, *Technopoly* (New York: Vintage Books, 1993).

[9] To note but a few key examples: Paul Tillich, "The Technical Society As Symbol (1928)," in *The Spiritual Situation of our Technical Society* ed. J. Mark Thomas (Macon, Ga.: Mercer University Press, 1988), 179-184. Paul Tillich, *The System of the Sciences According to Objects and Methods*, trans. Paul Wiebe (Lewisburg: Bucknell University Press, 1981); Paul Tillich, "The *Logos* and *Mythos* of Technology (1927)," in *The Spiritual Situation in Our Technical Society* ed. J. Mark Thomas (Macon, Georgia: Mercer University Press, 1988), 52ff.; Paul Tillich, "The Person in a Technical Society (1953)," in *The Spiritual Situation of our Technical Society* ed. J. Mark Thomas (Macon, Ga.: Mercer, 1988), 123-26; Paul Tillich, *Systematic Theology*, 3 vols., vol. 3 (Digswell Place: James Nisbet & Co. Ltd., 1964), 276ff.

[10] For information about technology in the context of bioethics, see: James Gustafson, "Theology Confronts Technology and the Life Sciences," in *On Moral Medicine: Theological Perspectives in Medical Ethics* ed. Stephen E. Lammers and Allen Verhey (Grand Rapids: Eerdmans, 1998); William F. May, "The Sacral Power of Death in Contemporary Experience," in *On Moral Medicine: Theological Perspectives in Medical Ethics* ed. Stephen E. Lammers and Allen Verhey (Grand Rapids: Eerdmans, 1998); Allen Verhey, ed., *Religion and Medical Ethics: Looking Back, Looking Forward*, vol. 1, *The Institute of Religion Series on Religion and Health Care* (Grand Rapids, Michigan: Eerdmans, 1996).

light of technology's ability to shape both our perception of the world and its physical form as well.[11]

Despite the prominence of technology as an object of reflection in these theological sub-disciplines, seldom is the history of technology (or more specifically, the history of thinking about technology) addressed alongside such discussions. In order to effectively come to a critique of the culture surrounding information technology (as evidenced through posthuman discourse), this thesis will first determine what material, historical, and cultural trends have been in operation preceding IT's own development.

Defining Technology

Technology has made an undeniable mark on human evolution and culture. Physical anthropologists view tool use and symbolic reasoning as cooperative elements which were coupled together in the early cognitive developments in proto-human hominids.[12] Our capacity for fabricating tools, using technologies, and projecting our will and actions using material conveyances is integral to what it means to be human. As with other cultural forms, material culture (of which technology is a subset) is a manifestation of humanity's innate capacity for self-transcendence and openness to the world,[13] two facets to philosophical anthropology which mimic the inner and outer perceptual movements of the Husserlian lifeworld or the subject and object

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[11] Michael Northcott, *The Environment and Christian Ethics*, New Studies in Christian Ethics (Cambridge: Cambridge University Press, 1996); Lynn White, "The Historical Roots of Our Ecological Crisis," in *The Sacred Earth: Religion, Nature, Environment* ed. Roger S. Gottlieb (London: Routledge, 1996).

[12] See: Alan Dean, *Complex Life: Non Modernity and the Emergence of Cognition and Culture* (Aldershot: Ashgate, 2000).

[13] Max Scheler, *Man's Place in Nature*, trans. Hans Meyerhoff (Boston: Beacon Pres, 1961), 37. Scheler's work on the topic of philosophical anthropology is useful at this point. He argues that, as distinct from animals, humanity with its capacity for 'openness' is able to grasp and impose upon the material world, the qualities of thingness and objectivity. This entails being able to transform the world into a world of meaning, both psychologically and through material and cultural means. Scheler's work, though not specifically 'technological' provides a philosophical language with which one can understand technological activity. The themes of thing, object and technology are also dealt with in later Tillich's writings, as will be cited below.

elements of Kantian transcendental idealism. The extent to which technology has contributed to the creation of the human-cultural world, and the degree to which this contribution is a result of technology's essential nature, its dependence upon divine inspiration, or its emergence from human use and culture, will be partially constitutive of this section's analysis.

I believe that technology can only be defined in terms of its context within human creativity and human culture. Technologies are created within a particular time, for particular purposes and although their use may differ from the intentions of their creators, technologies receive their meaning at the nexus of use and invention. They are, in sum, devices which must be defined hermeneutically and whose meanings can only be determined by context. This anti-essentialist definition of technology has not always been the preferred interpretation of what technology is (or technologies are). To iron out the historical nuances of our present task, an historical and philosophical discussion of technology must be pursued. With this in mind, in this chapter I will examine the historical roots of technology and offer a cursory look at how thinking about technology has been represented in three pivotal moments in pre-industrial European thought. The first instance will examine the place of *techne* in the Classics, with particular interest in Aristotle. The second will note how, according to Lynn White, technology contributed to the shape of Medieval Europe. The third will explore how technology was appropriated by Francis Bacon. In this historical survey, we will note how the material and philosophical history of technology reveals a shift from a belief in *techne* or technology as that which is created for its own purposes (Aristotle), to that which is created as a means of domination and sublimation (White's vision of the Middle-Ages), to that which is used as a means of viewing the world (Bacon). Thus, in our survey of the historical roots of technology, technology will be understood as evidencing three particular traits: making, doing, and revealing.

Historically speaking, a wide net has been cast for this chapter. This is not because the intervening years between the Classics, Middle Ages, and the Renaissance are devoid of merit, but simply because these three periods are representative moments which provide continued impetuous for thinking about technology even in contemporary dialogue. Classical comment on *techne*, poiesis and epistemological ordering; medieval actions evidencing the colonisation of the world

through technology, and Bacon's re-ordering of the sciences as a highly technologised intellectual pursuit, are topics still dealt with in current philosophical and practical reflections on technology.[14] What follows is not an exhaustive survey, but an illustrative prolegomena which will fuel the discussion of essentialism and totalism to follow.

Furthermore, a moment spent looking at a historical overview of thinking about technology is justified in light of the relationship which technological essentialists exhibit towards history. Those with a dystopian or quasi-dystopian attitude towards contemporary technology (among the essentialists discussed in chapter two, Heidegger, Ellul and Borgmann), unanimously perceive technologies of past generations to be preferable to contemporary technology. Whether it is handicraft technologies for Heidegger or Native American tool-use for Borgmann, technologies of the pre-industrial era are coated with a beneficent sheen which glamourises the past in contrast to the current state of the technological age. Conversely, technological utopians or quasi-utopians (Ernst Kapp and Frederick Dessauer in chapter two, the posthuman speculative scientists in chapter eight), perceive the technologies of the present and future to be the means by which human potential comes into actuality. In this chapter, to subvert the tendency for an *argumentum ad antiquitatem* the following survey conveys the historically, culturally, and materially embedded nature of technologies, whereby the reification of technologies by essentialists can be resisted. In further chapters, the utopian tendency to aggrandise the future will be addressed by an appeal to a realistic hermeneutics of technology.

Technology as Making: Techne *in the classics*

Literally, techno-logy is the study of *techne,* a term related to the Indo-European stem *tekhn-* meaning 'wood work' or 'carpentry'. There are correlates of the phoneme in Sanskrit and Hittite,

[14] Indeed, these three periods are almost universally covered in introductory texts in the philosophy of technology and identified as key movements in the development of a philosophy of technology. See: Frederick Ferre, *Philosophy of Technology*, Prentice Hall Foundations of Philosophy, ed. Elizabeth Beardsley, Tom Beaucham and Monroe Beardsley (Englewood Cliffs, New Jersey: Prentice Hall, 1988); Don Ihde, *Philosophy of Technology an Introduction*, Paragon Issues in Philosophy (New York: Paragon House, 1993); Carl Mitcham, *Thinking Through Technology: the Path Between Engineering and Philosophy* (Chicago: University of Chicago Press, 1994).

and of course in Latin and Greek.[15] In the Classics, *techne* would have been understood as 'craft' or 'art' or 'skill', which is how *techne* was employed by both Plato and Aristotle.[16] One finds in Plato's *Philebus* and Aristotle's *Nicomachean Ethics* the development of a definition of *techne*, which views the term as a combination of productivity and creativity – the application and embodiment of understanding and intentionality to a particular act. [17]

In the *Nicomachean Ethics,* Aristotle asserts that *techne* can be defined as the following:

> All art [*techne*] deals with bringing some thing into existence [*genetai*]; and to pursue an art [*techne*] means to study how to bring into existence a thing which may either exist or not, and the efficient cause of which lies in the maker and not in the thing made; for Art [*techne*] does not deal with things that exist or come into existence of necessity, or according to nature, since these have their efficient cause in themselves. But as doing [*praxis*] and making [*poiesis*] are distinct, it follows that Art [*techne*], being concerned with making, is not concerned with doing...[18]

Central to Aristotle's understanding of *techne* is the assertion that t*echne* constitutes that which is made or fabricated (*poiesis*) and is not that which is *used* in making or fabrication. The difference between doing and making (*praxis* and *poiesis*) may at first appear insignificant, but in light of how

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[15] Hittite: *takkss* – 'to join'; Sanskrit: *taksati* – 'to fashion'; Greek: *technikos* – 'skillful'; Latin: *texere* – 'to weave'.

[16] *Techne* is discussed broadly throughout Classical philosophy. Xenophon (see note below), the Stoics, Alexandar of Aphrodisas and Plotinus all discuss *techne* and *techne*'s relationship to *episteme.* The majority of what follows in this section deals with Aristotle and his position on *techne* simply because his work has been employed in the early-20th century's most important philosophy of technology, Heidegger's 'Question concerning technology.' For further reflections on the Classics and *Techne*, I refer the reader to the more exhaustive treatment of the subject in Carl Mitcham, *Thinking Through Technology,* 118-134.

[17] In the later *Philebus,* Plato separates knowledge into two parts, productive-knowledge and educational/supportive-knowledge. Throughout this discourse, Socrates attempts to prove to Protarchus that there is an element in the technical arts which is aligned more closely to purity of knowledge than to simple raw production. The amount of knowledge which is executed in the technical act varies based upon the act to be undertaken itself. Despite their variability, Plato asserts that technical 'knowledges', such as music, medicine, or agriculture, are a manifestation of a skill that is primarily associated with activities of production and operation, as acted upon in the material world. Plato, *Philebus*, 55d-56e.

[18] Aristotle, *Nicomachean Ethics,* 6.4.1140a 4-6

Aristotle's use of *praxis* and *poiesis* are employed viz. contemporary reflections on technology (especially in Heidegger); Aristotle's distinction is worth mentioning. It would seem that by explicitly placing *techne* in line with *poiesis* rather than *praxis,* Aristotle seeks to argue for a teleological understanding of *techne. Poiesis* is to make something where the telos is external to the act of making, whereas in *praxis* the telos is intrinsic to the action itself. To build something or to make something for the sake of producing an object at the termination of labour is to engage in *poiesis*. Productive labour has an external goal which is the end of the labour. To do something simply for the sake of doing it is to engage in *praxis. Poiesis* is like building a house in order to create a home for someone else. Once the house is complete, the worker is paid and he goes on to another project. *Praxis* is like being a parent, where the reward for the effort is found in the task itself.[19] Aristotle continues:

> Art [*techne*], therefore, as has been said, is a rational quality [*meta logou*], concerned with making [*poiete*], that reasons truly [*alethous*]. Its opposite, lack of Art [*atechnia*], is a rational quality, concerned with making, that reasons falsely [*meta logou pseudous*]. Both deal with that which admits of variation.[20]

Within *techne* there is an innate ability to 'make' which is dependent upon a 'correct awareness of or reasoning about the thing to be made.' Conversely, 'the absence of *techne* in an ability to make involves either the absence of any *logos* or the presence of a false *logos*.'[21] To make *techne*, and more importantly to make good *techne*, one must employ both reason and rationality. In this regard, the creation of *techne* requires the implementation of something which is seemingly akin to *episteme*, though at least for Aristotle *episteme* is not directly involved in the creation of *techne*, as

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[19] See also earlier Classical understandings of *techne*. According to Xenophon, Socrates considered playing the harp, piloting a ship, cooking, medicine, managing an estate, smithing, and carpentry all to be forms of *techne* (*Memorobillia*, III.5). Indeed, in Xenophan, Socrates seems to link *episteme* and *techne* in a way that is even regarded excessive by Plato's standards. Plato had no problem considering the various activities of the *technai* of medicine, physical training, judging, playing. These *technai* are explicitly linked with episteme and are both goal-oriented and productive nature. See: Plato, *Republic,* 346a.

[20] Aristotle, *Nicomachean Ethics,* 6.4.1140a4

[21] Carl Mitcham, *Thinking Through Technology,* 120.

for Aristotle the object of *episteme* is that which is not apt to change; a characteristic antithetical to the flexible nature of *techne* and *poiesis*. Nonetheless, the *poiete* of *techne* has much more in common with inductive *episteme* than it does with empirical knowledge that is derived from experience, inasmuch as one who employs *episteme* and one who creates *techne* both reflect something which is transcendent and universal, as opposed to something that is as unstable as lived-experience.[22] Aristotle writes:

> For the experienced know the fact, but not the wherefore; but the artists know the wherefore and the cause. For the same reason we consider that the master craftsmen in every profession are more estimable and know more and are wiser than the artisans...[23]

In contrast to the master craftsman (*archi-tektonas*), the mere artisan (*cheiro-technon*) goes about their technical duty without actually knowing what it is that is being done. The emphasis here being that the making (*poiete*) of *techne* is a task in which intentionality arises out from the craftsman into the object at hand. To make *techne* absent intentionality is to make *techne* that is absent the *logos*. Yet the preferencing of the *poiete* of *techne* over *emperia* is not the wholesale elevation of *poeisis* or *techne* to the level of *episteme*. Indeed, the principle difference between how Aristotle understands *techne* and the modern understanding of technology is the epistemological ordering of *episteme*/science over and above *techne*/technology. Although Aristotle would have argued that science (*episteme*) and technology (*techne*) are two forms of teachable knowledge, they are fundamentally distinct on several levels. The most obvious and crucial distinction between the two is found in the division between practical and theoretical 'knowledges' which is described in greater detail in the *Metaphysics*. Practical knowledge (which includes all forms of technical skill) is concerned primarily with changeable objects that are resident in the material world. Theoretical knowledge, on the other hand, focuses exclusively on matters regarding permanence of the immaterial world.[24] The unchanging is preferred to the changing, and so theoretical sciences are separated from technical (in this instance, *poietic*)

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[22] Aristotle, *Metaphysics,* 981a1-15

[23] *Ibid.,* 981a4

[24] Aristotle, *Nicomachean Ethics* 1139 b 23; 1140 a12ff

sciences in the following four ways: 1) Aristotle argues that the theoretical bears its own sense of motion, whereas technical objects receive motion via an external source;[25] 2) the goal of theoretical knowledge for Aristotle was to arrive at a universally applicable general theory, whereas the goal of technical and practical knowledge was always oriented towards specific applications which were particular and concrete.[26] 3) As has been intimated above, Aristotle argued that theory and practice were differentiated based upon the notion of teleology: one who practices theory seeks after something which has an end in itself (its own self-determined *telos*) whereas a technologist produces a thing that has an end based upon the need of the technologist; and as a corollary to the fourth point, 4) the purpose of science is science itself whereas the purpose of technology, is in the use of the technology.[27]

In attempting to understand the historical roots of *techne*, it is beneficial to consider the actual technologies which would have served as the material referent for Aristotle's use of the term with the material referents which we consider to be technology today. According to L. Sprague Decamp's *The Ancient Engineers,* classical Greek technological advances were principally matters of aesthetic rather than practical concern, which is to say, for a Greek technologist it was less important to develop an innovative or practical technology employed in the service of a specific end, than to create objects which were principally of artistic value. Decamp's broadly sweeping thesis seems to ignore the fact that Greek material culture was filled with sophisticated inventions, yet Decamp would see these inventions as ultimately being used in the service of aesthetic or cultic purposes. In particular, he cites architectural practices of Greek engineers who were content to copy patterns used previously in wood buildings, changing the design only slightly to accommodate the new medium. This seems to indicate that in contrast to contemporary technology (as defined below), Greek technology was less concerned with innovation than it was design.[28]

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[25] Aristotle, *Metaphysics.* 1064 a 10ff

[26] *Ibid.,* 981 a 15ff.

[27] Aristotle, *Nicomachean Ethics* 1177 a 17ff; 1139 b 1

[28] L. Sprague DeCamp, *The Ancient Engineers* (New York: Dorset Press, 1963), 93.

Decamp's thesis is substantiated by the Roman historian Plutarch in the *Life of Marcellus,* where it was said of the work of the Greek mathematician and inventor Archimedes:

> Yet Archimedes possessed so high a spirit, so profound a soul, and such treasures of scientific knowledge, that though these inventions had now obtained him the renown of more than human sagacity, he yet would not deign to leave behind him any commentary or writing on such subjects; but, repudiating as sordid and ignoble the whole trade of engineering, and every sort of art that leads itself to mere use and profit, he placed his whole affection and ambition in those purer speculations where there can be no reference to the vulgar needs of life...[29]

The relegation of what we would call practical technologies to the 'vulgar needs of life,' is a telling insight into the Classical Greek understanding of technology – technology was something for the masses, common, and unrefined. Classical techne signals the production of an object with a defined end. Though this relegates technical creations to a lower and more 'vulgar' dimension of life, it prevents technologies from becoming the locus for valuation. Concepts of the good, beauty, and value reside out with technical creations in the higher reaches of the epistemological hierarchy. For this reason, Heidegger (described in chapter two) is able to reflect upon a classical definition of *techne* for his solution to the problem of contemporary technology. A more contemporary figure, Edward Ballard has likewise relied upon the Classics to determine an alternative philosophy of technology which reflects the demands of the present situation. This is a situation that witnesses technologies becoming more *praxis*-like (self-authenticating productions) than *poiesis*-like (productions pursued for external ends). In his *Man and Technology*, Ballard has employed classical themes to address the problem of value in a 'technological society.' Ballard's work seeks to form a humanist philosophy of technology which addresses the technological nature of contemporary society by reasserting humanity's distinctive social/ethical dimension in light of the inner drive towards the good life. To accomplish this, Ballard wishes to emphasise the qualitative dimension to existence, in contrast to the quantitatively-centred nature of technical culture. By looking for the 'better' rather than the 'more', Ballard allows the subjective (what he would term

[29] Plutarch, *Lives*, trans. Arthur Hugh Clough, vol. 1 (New York: The Modern Library Classics, 2001), 420.

ontological) dimension of life to flourish in contradistinction to a culture which is ever driving towards empty materiality (which is quantifiable), rather than meaningful existence (which is only qualifiable).

Unlike questions of quality, questions of quantity are easily determined through scientific and empirical means. For instance, I can count the number of items on a shelf, measure the weight of atomic particles, but I cannot answer the question of 'What is their value?' without asserting some kind of subjective claim. This, according to Ballard, is the area in which ontology becomes a necessary element in establishing ethics and morals in technological culture. For Ballard, the quality of a technology is a function of its ontology – the kind of being it is in relationship to other beings.[30]

Ballard's ontology relies upon the Platonic ideal of the good life, and argues for what is tantamount to a re-appropriation of technological 'desire'. Sadly, however, his argument is little more than a repetition of a classical ethics reflecting the epistemological distinction between theoretical and practical knowledge. Ballard's pursuit of a 'forms'-like quality of life over a materially-ridden life of quantifiable technologies is a noble but ultimately impossible, retreat into a Classical ethical milieu. Furthermore, by asserting an ontological reading of technology, he leaves open the possibility of technological essentialism.

Neither an appeal to a Classical metaphysic nor the Classical reading of *techne* as handicraft is a viable interpretative option in the face of contemporary technology. Nonetheless, the Classics are certainly not without merit for the definition of technology sought after by this thesis. Aristotle, by positing that 'good' *techne* appears when a *techne* is designed and used for a specific purpose – according to a right application of reason – introduces a rubric for judging the quality of a technology by virtue of its appropriateness for a specific task. For the hermeneutics of technology discussed in chapter three, where technology's meaning is seen to arise at the crux of invention and application, this point is significant. Yet the challenge which the anti-essentialist philosophy

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[30] Edward Goodwin Ballard, *Man and Technology: Toward the Measurement of a Culture* (Pittsburgh: Duquesne University Press, 1978).

advocated here must address is how to determine the appropriateness of a technology apart from an appeal to the logos.

Technology as Doing: Lynn White and the Middle Ages

In contemporary philosophies of technology, one of the most prominent critiques of *techne* in the Classics is rooted in the Classical sublimation of *techne* (as the technical arts) underneath the higher-level pursuits of pure reflection.[31] Though good *techne* is made through the application of a 'good' *logos*, the material embodiment of *techne* places it lower on Aristotle's epistemological hierarchy than other forms of knowledge. This prejudice does not appear to be the case in Lynn White's reading of the Middle Ages. The chief difference between a classical reading of *techne* and White's understanding of Medieval technologies would seem to stem from the rise of the Christian cosmology which regarded human technical ability to be a direct expression of the divine creative will.

Lynn White has suggested in his essay 'The Historical Roots of our Ecological Crisis' that the European shift from a Classical cosmology to a Medieval Christian cosmology (and teleology) accounts for the shape of the contemporary technological culture. White observes that in contrast to the cyclical views of history and sacred vision of nature which were held by pre-Christian pagan religions, Christianity asserted a definite beginning and end to world history and a dominative perspective over nature which demonised the historical and natural worlds in light of the world to come.[32] He argues that 'the victory of Christianity over paganism was the greatest psychic revolution in the history of our culture,'[33] which manifested itself by reorienting humanity's understanding of its relationship with nature and history. The new relationship to nature and history imposed by the ethos of Christian Europe viewed nature as an object which could be made to serve ends that originated from societal/religious goals, rather than ends which originated within itself. Technology was no longer a changing expression of an unchanging reality, but rather a tool

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[31] Don Ihde, *Philosophy of Technology an Introduction,* 20.

[32] Lynn White, "The Historical Roots of Our Ecological Crisis," in *The Sacred Earth: Religion, Nature, Environment* ed. Roger S. Gottlieb (London: Routledge, 1996), 189.

[33] *Ibid.,* 188-9.

by which a changing nature could be brought into submission to the will of God. Indeed, nature itself was no longer seen as a free entity which possessed its own natural teleology, but merely an object subsumed under human control. White notes that in response to the view of sacred-nature advanced by paganism, Christian theology exorcised the animating spirits of the natural world:

> To a Christian a tree can be no more than a physical fact. The whole concept of the sacred grove is alien to Christianity and to the ethos of the West. For nearly two millennia Christian missionaries have been chopping down sacred groves, which are idolatrous because they assume spirit in nature.[34]

In a nature denuded of its sacred import, Christian Europeans were free to explore the world with the intent of pursuing further means of technological domination, with the ends of the Kingdom of God in mind. From the far-ends of the European trade routes, travellers and crusaders returned to their native lands bearing in their arms the technologies and applied sciences of Africa and the Orient. From Iran and India, Europeans acquired the technology of the windmill[35], from the broader Arabic world Europeans were given knowledge of the astrolabe[36], and even something as pedestrian as the stirrup – used to keep a rider in the saddle – was acquired through international trade *cum* warfare during the Norman Conquest of England.[37] Despite the relative scarcity of written material by technologists (or about technology) during Europe's Middle-Ages; the era was a locus of revolutionary changes in technological sophistication, as trade and innovation contributed to the formation of the later aristocracy. It was only through technological superiority that even the most diminutive European nations could assert global domination.[38]

White's damning critique of Medieval Christianity and its contribution to the contemporary ecological crisis is not without its critics. Ian Barbour in his *Ethics in an Age of Technology* argues that White oversimplifies the worldview of the Middle-Ages by ignoring the impact of Greek and

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[34] *Ibid.*, 191.

[35] Lynn White, *Medieval Technology and Social Change* (Oxford: Clarendon, 1962), 80-5.

[36] *Ibid.*, 123.

[37] Frankish armies were unaware of stirrup technologies until it was acquired from Anglo-Saxon tribes in the 11th century. *Ibid.*, 36.

[38] Lynn White, "The Historical Roots of Our Ecological Crisis,", 187.

Roman thought in Medieval Europe's use of technology and by overemphasising the role of 'domination' (over nature) in Medieval Christian theology. Barbour suggests that Christianity is in fact deeply concerned with its relationship to the environment, citing as his example the biblical themes of stewardship and the celebration of nature.[39] Barbour's ardour to preserve the environmental responsibility of Christianity is laudable. Indeed, it is the central argument of his course of 1990/91 Gifford Lectures that Christian theology must engage proactively with science and technology as an expression of Biblical and Historical faith. Nonetheless, it would appear that had medieval Christianity adhered to the naturalism argued for by Barbour, the historical events which colour White's critique would have never taken-place. White's history posits that the Christian commendation for good stewardship of the earth only had limited influence on Medieval thought, in contrast to Barbour's assertions

The Classical definition for *techne* as a means of *poiesis* rather than *praxis* has been reversed in Medieval technologies, where the emphasis is less upon the artefact than upon what the artefact can accomplish. Rather than functioning as devices which are the produce of a culture, technologies in this example function as devices which are enlisted in the development of a culture. If a good *techne* for Aristotle was a *techne* that clearly reflected the *logos*, in White's Medieval Europe good technology is seen as an effective technology. Yet, the measure of effectiveness seems a paltry alternative to the rule of appropriateness advanced by Aristotle above. Though the Medieval example does allow technology to take on a more active role in constituting the cultural world, it does so at the expense of one's ability to critique the worth of technology by more than merely its own designs. Though freed from the *logos*, the problem touched upon at the conclusion of the section above, there appears to be no space for ethical reflection in the example offered by Medieval technologies. Seeing technologies as a means rather than and ends – as a mode of production rather than an object of production – lays the groundwork for the final historical example in this chapter – Instrumental Technologies and Francis Bacon.

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[39] Ian Barbour, *Ethics in an Age of Technology*, The Gifford Lectures 1989-1991, vol. 2 (London: SCM, 1992), 75-6.

Technology as Revealing: Instrumental Technologies and Francis Bacon

White's thesis contends that the pragmatic technologies of medieval Europe contributed to the trajectory that led to the instrumental understanding of technology in the Renaissance empiricism of Francis Bacon. In Bacon, the distinction between science and technology conflates, as technologies become more than either ends or means, but rather a mode of revealing. In the physical sciences in particular, from Bacon forward we see a trend to use technologically-dependent modes of investigation, where instruments mediate the objects of scientific reflection. The elevation of instrumental technologies in Bacon's pursuit of the sciences, lays the foundation for what philosopher of technology Don Ihde would term the ontological and historical priority of technology over the sciences. In Bacon 'science gains both its knowledge and its power from instruments,'[40] implying that the ability of scientific thought to manipulate and control nature is, from Bacon forward, predicated upon the development of instrumental technologies. This 'Baconian' priority of technology over the sciences creates a precedent for a new type of interface between science and technology; one which in Ihde's opinion is surprisingly modern. Ihde argues that 'contemporary science...is both technologically *embodied* in its necessary instrumentation and also *institutionally embedded* in the social structures of a technological society.'[41] Bacon's 'New Science' is also a new technology. In his work there is a marriage of the *praxis*-nature from Medieval though with the *poiesis*-nature described in the Classics. For Bacon this shift is played out within a new Christian cosmology which saw the world as less a subject of domination, and more an object of inquiry.

It would appear that the contemporary interdependence of technology and science owes a great deal to the methodology practiced by Bacon and his instrumental approach to the sciences. Even though from the perspective of contemporary philosophy, Bacon's work has largely been eclipsed by the more elegant thought of René Descartes, unlike other early scientific luminaries (e.g. Copernicus, Galileo, or Newton) Bacon's legacy was not a collection of theories that shook the

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[40] Don Ihde, *Instrumental Realism: the Interface Between Philosophy of Science and Philosophy of Technology* (Indianapolis: Indiana University Press, 1991), 62.

[41] *Ibid.*

foundations of thinking but a methodology which required that science be materially verifiable through the use of experimental instrumentation. His famous declaration 'knowledge is power' heralded the rise of a new kind of knowledge and a new kind of power. The knowledge which Bacon sought was not grounded in the contemplation of the forms, nor in the pursuit of a pure theory, but in a quest for changeable, adaptable, and most of all experimental and technological form of knowledge.

This brings us again to the question of what makes a 'good' technology. As noted above, for the Classics a good *techne* was a *techne* that clearly reflected the logos and for White's Medieval example, a good technology was a technology that was able to effect a given end. In Bacon, however, good technology is neither dependent upon the *logos* nor merely measured in terms of effect, but rather judged in terms of its ability to transparently mediate the underlying reality which it is used to explore. Thus, the measure of a good technology becomes its ability to efficiently reveal. Bacon's use of technology, and indeed his philosophy of science, is in stark contrast to discussion of Aristotelian *emperia, episteme, poiesis* and *techne* as explicated above. Whereas Aristotle argued that *episteme* was prior to (though akin) the *poiesis* involved in *techne*; *emperia* was relegated to the lowest rung in his epistemological hierarchy. According to Bacon, systematic knowledge (*episteme*) could only truly be gained by way of empirical data which was derived from the use of technology.

As evidenced by his contemporary René Descartes, Aristotelian intuitivism was still the prevailing method of scientific research in Bacon's day. Although Descartes is well known for his interest in mechanics and machine-equivalences to human beings,[42] when it came to his scientific method he chose to follow Aristotle by placing the onus of scientific inquiry upon the task of reflection and deduction rather than experimentation. Descartes scientific method begins with a statement of faith in the ability of the reasoned mind to pursue scientific knowledge apart from any exterior assistance: 'Good sense is the best distributed thing in the world: for everyone thinks

[42] Gaby Wood, *Living Dolls: A Magical History of the Quest for Mechanical Life* (London: Faber and Faber, 2002), 6-7, 9, 22.

himself to be so well provided with it that even those who are the most difficult to satisfy in every other thing are hardly accustomed to desire more of it than they have.'[43] In contrast, Bacon argued that in order for one to pursue 'scientific' knowledge of the world, one must overcome the impediment of classical thinking which ordered theoretical knowledge above practical (and verifiable) knowledge:

> For knowledge is like a water that will never arise again higher than the level from which it fell; and therefore to go beyond Aristotle by the light of Aristotle is to think that a borrowed light can increase the original light from whom it is taken.[44]

Bacon's reliable knowledge was knowledge that was based upon observations and experiences which were rooted in one's probing of the material world.[45] Unlike Aristotelian intuitivism, Baconian empiricism placed the practice of engaging with the object of scientific study above the theory which under girded scientific thought.[46] 'The secrets of nature reveal themselves more readily under the vexation of art than when they go their own way.'[47] Therefore, knowledge for Bacon was primarily founded in the data of experimentation and subsequent reflection upon the 'particulars' of this data. Technology as instrumentation became the foundation for Bacon's new-kind of science: a science of disclosure which based its findings upon a mediated vision of the material world. Through instrumentation – a crafted lens guided by a skilled hand – a hidden world was revealed to the tool-user. This world was one which for Bacon was buried by God himself, and only made available for humanity to uncover (and discover) at an appointed time. Bacon himself once asserted that it is 'the glory of God is to conceal a thing; the glory of the king is to

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[43] Rene Descartes, *Discourse on the Method: Of Conducting One's Reason Well and of Seeking the Truth in the Sciences*, trans. George Heffernan (London: University of Notre Dame Press, 1994), 15.

[44] Francis Bacon, *Valerius Terminus: of the Interpretation of Nature*, 2.4.

[45] *Ibid.*, 3.7.

[46] See also: Joachim Schummer, "Challenging Standard Distinctions Between Science and Technology: the Case of Preparative Chemistry," *International Journal for Philosophy of Chemistry*, 3 (1997).

[47] Francis Bacon, *The Philosophical Works of Francis Bacon, reprinted from texts and translations with the notes and prefaces of R.L. Ellis and F. Spedding*, ed. J. W. Robertson (London and New York, 1905), quoted in Ian Hacking, *Representing and Intervening: Introductory Topics in the Philosophy of Natural Science*. (Cambridge: Cambridge University Press, 1983), 246.

search it out.'[48] Perhaps his sentiment was better expressed by his contemporary George Herbert in the poem *Elixir*:

> A man that looks on glass,
> On it may stay his eye,
> Or, if he pleaseth, through it pass,
> And then the heav'n espy.[49]

Bacon of course was not alone in his instrumental use of technology. Natural philosophy of the 17th century was a boon for scientific research through instrumentation. For Bacon and others engaged in the instrumental use of technology, technology became a means of revealing, uniting the sense of *poiesis* in Aristotle with that of *praxis* in the Middle Ages.

Conclusion

In this chapter, we have noted a shift in the evaluative rubric by which a good technology is determined, from a good technology being a function of its appropriateness (as measured against the *logos*), to its effectiveness (in serving as a means to an end), to its efficiency (in transparently revealing the world below). Concordantly, the task of qualifying good technology becomes increasingly difficult as the goodness of a technology is associated less with actual technologies and more with the reified concept of Technology. Indeed, this is reflected by the fact that technologies themselves become ess substantial and more essential, less objective ends and more means and processes.

In conclusion, this brief survey of pre-industrial European technologies provides this thesis with four important points. First, we see that in order to overcome the tendency towards an *argumentum ad antiquitatem*, we can appeal to the dissimilarities between the material and historical contexts from which historical and contemporary experiences with technology emerge. As technologies change, society's relationships to such technologies change as well, requiring one's understanding of technology to be ever revised and revisited. If technological essentialism

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[48] *Ibid.*

[49] Herbert, George. *The Works of George Herbert in Prose and Verse.* (New York: John Wurtele Lovell, 1881), 288-289.

fails to be disproved by any other argument lodged in this section, the single fact of technology's changeability should alone put to bed any advocacy for an unchanging technological essence. Secondly, as we shall see in following chapters, technology's dependence upon its historical situation means that deriving a contemporary technology's meaning solely from a historical definition of technology is an extremely imprudent task. This said, the Classical example of a good *techne* being judged so by virtue of its appropriateness will be revisited in the hermeneutic philosophy of technology advocated in chapter three. Thirdly, the historical examples noted above and discussed further in chapter two, speak to the tendency for technologies to become reified – as the objects and ends of technology recede in favour of the processes and means of technology.[50] Fourthly, the historical survey has demonstrated how technologies have been understood at various times as both *poietic* devices which reveal an underlying reality and as practical devices which are put into use to accomplish a given end. In this light, the task of determining a philosophical language for our thinking about technology, must take into consideration the affect and the effect of technological production, whilst not forgetting the intentionality of technological invention. Having defined technology as that which both does and reveals, and having briefly discussed the historical roots of European technology from the Classics to the Renaissance, this thesis can now more specifically engage with the problem of technological essentialism and the inadequacies of cybernetic totalism.

[50] In the language of Hungarian critical theorist György Lukács, an essence of technology arises through reification, which is 'the appearance of people's productive activity as something strange and alien to them.' David Held, *Introduction to Critical Theory: Horkheimer to Habermas* (Berkeley: University of California Press, 1980), 22.

Chapter 2: The Philosophy of Technology and the Essentialist Tendency

This chapter will trace the development of an essentialist philosophy of technology, beginning with the left-Hegelian response to late-Industrialism – what I term the Prosthetic School of the philosophy of technology – to the formation in the Post-War and Post-Industrial periods of what I term the Essentialist School. Within the Prosthetic School we will note how the close coupling of the tool and its inventor/user affords to technologies a perceived 'ontological weight', whereby technologies are understood to possess an 'essence' that originates from their inventors/users. Within the Essentialist School the pseudo-ontology of technology advocated by the Prosthetic School in the late-industrial/pre-war philosophies of technology gives way to an essentialist reading of technologies in the post-war era. Martin Heidegger, Jacques Ellul, and Albert Borgmann will be examined as three chief representatives of this movement.

Heidegger's principal work on technology, the 'Question concerning technology', will be regarded as the chief example of technological essentialism, wherein contemporary technologies and their inauthentic mode of revealing the world are contrasted with the poietic handicraft technologies of former times. In Ellul, contemporary technologies will be seen as the driving force behind what he regards to be the increasingly depthless nature of contemporary culture. Whereas Heidegger hoped for a pre-modern return to handicraft and art as a means of recovering authenticity in a technological culture, Ellul holds out a pessimistic hope in the coming Kingdom of God. The last figure, Albert Borgmann, argues that technology is essentially self-seeking but that through an altruistic ethic one can attempt to overcome the dominant ethos of a contemporary technological culture. Though a technological essentialist, Borgmann believes that the essence of technology can be curtailed if culture appeals to the Good. As will be reflected in later chapters on posthuman discourse, it is this post-war philosophy of technology that continues to feed both the dystopian fear of technology and the utopian faith in technology that is endemic to the culture surrounding IT. Technological essentialism, either in terms of the quasi-ontology of the prosthetic analogy or the fully-formed essentialism of Heidegger, Ellul, and Borgmann, is inconsistent with

an understanding of technology that seeks to discover technology's meaning at the nexus of use and invention.

As noted in the Introduction, and as explored more fully in chapter five and section two, technological essentialism exhibits itself within the culture surrounding information technology whenever the fecundity and beneficence of information technologies are touted as the means by which humanity can achieve authenticity. This is most pronounced in the posthuman ideologies of speculative scientists and critical theorists, and is critiqued by the ironic or ambiguous portrayal of posthuman technologies in fiction and film. Faith in the unchanging goodness of information technology, as will be described in Chapter 5, gives way to the belief in cybernetic totalism. Cybernetic totalism asserts that all reality is best understood through either a cybernetic analogy or through technological mediation. Technological essentialism and cybernetic totalism contribute to the techno-theology that is endemic to the culture surrounding information technology. Combined, these two errors give credence to the belief that information technology is an object of ultimate significance. However, as will become clear in the anti-technology writings of Heidegger and Ellul, a predisposition to technological essentialism is not limited to the proponents of technology. Whenever one takes a fatalist view of technology or argues that technology can neither be changed nor affected by culture, this critique gives into an essentialist philosophy of technology, where technological narratives become self-authenticating and normative.

The Prosthetic School

The Prosthetic School asserts that technologies function as extensions of human being, offering a material means of 'transcendence' or a prosthetic extension of being. This school is a direct result of left-Hegelian thought, as it reflects the left-Hegelian inversion of the Hegelian dialectic. Before we can seek to understand the Prosthetic School's philosophy of technology, a brief and perfunctory word must be said about Hegel's philosophical aims, particularly regarding the teleology of history.

Hegel's philosophy, as is common knowledge, centred around his claim that history is unfolded through the process of reason (*Vernunft*) coming into self-consciousness. This is exemplified

through the reconciliation of thought and object, freedom and necessity.[1] Spirit (*Geist*) is elevated over and against the material world, as the expression of the drive of history towards the Absolute. It was Hegel's thesis that objects in the world existed principally as objects of perception, which were known exclusively through an object's interactions with *Geist.* Direct, unmediated experience with the material world would have been strictly impossible. As such, the only world known by humans was the world of the human mind; the world we know is the only world that exists for us.

The interaction between mind and world was described as a dialectical process of objectification and alienation. As the mind objectifies itself through the production of material, social and political goods, it becomes alienated with the products of its own creation. It fails to recognise that the world which it perceives – filled with the objects that it creates – is merely a part of itself. For Hegel, the whole of human history can be seen as the process of objectification and alienation, which is eventually fulfilled through gradual stages of enlightenment. For Hegel, the goal of history is the mind's self-awareness that all objects are objects of the mind, thus signalling the final stage in the mind's mastery of the world.[2]

In the eyes of his critics, Hegel's language was regarded to be overly spiritual, showing a blatant disregard for material culture and physicality. Left-Hegelian thought, principally characterised by Marx, inverts the Hegelian interpretation of history, and argues that it is in fact humanity's interactions with the material world which constitutes the authentic course of history. Faced with an increasingly de-spiritualised world, Ernst Kapp (1808-1896) and Karl Marx (1818-1883) sought to subvert[3] the Hegelian emphasis upon *Geist*, and posit an understanding of

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[1] David Held, *Introduction to Critical Theory: Horkheimer to Habermas* (Berkeley: University of California Press, 1980), 24.

[2] Peter C. Hodgson, ed., *G. W. F Hegel: Theologian of the Spirit*, ed. Joh W.de Gruchy, *The Making of Modern Theology: Nineteenth and Twentieth-Century Texts*, vol. 9 (Minneapolis: Fortress Press, 1997), 1-38.

[3] In the realm of theology, left-Hegelians like Feuerbach offered the ultimate subversion of the Hegelian dialectic. Whereas Hegel regarded *Geist* to be the only real, making the material an object of the mind, Feuerbach, Marx and Strauss posited that God was simply a figment of the mind, created for

humanity's place in the world which emphasised material culture as a key factor in attaining universal solidarity.

Despite the de-spiritualised language of left-Hegelian metaphysics, ontology creeps in by way of this School's attitude towards technology. The spirit's ability to transcend itself and the Hegelian teleology of human becoming are themes which find their replacements in technological equivalents. Self-transcendence is facilitated by technologies which function as prosthetic extensions of being. They allow their inventor/user's will, agency and being to be extend beyond the limitations of human flesh by way of material means. The prosthetic analogy imbues technology with a certain ontological value, as technologies are able to share in the essence of their users and creators. Likewise, human becoming which in Hegel's teleology was linked with the gradual enlightenment of *Geist,* is for both Ernst Kapp and Frederick Dessauer given material embodiment through the use and development of technologies. For these thinkers, technology extends humanity's reach into the world, making technology the means by which humanity attains its true potential. For Karl Marx, however, the prosthetic analogy plays out with negative implications as it signals the use of technology as an extension of the bourgeois will for the purpose of dominating the proletariat.

The Prosthetic School is germane to this thesis in two specific ways. First, the Prosthetic School contributes to the subsequent formation of the Essentialist School, by introducing essentialist language to the discussion of technology. Second, the theological revision of the prosthetic analogy offered by Dessauer subverts the essentialist argument by shifting the origins of the prosthesis from the human creator to the divine, a move which may be worth revisiting in the later discussion of posthuman rhetoric in section two..

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human benefit – a vestigial belief of a long-expired superstitious metaphysic which had little import in a material world.

Ernst Kapp: Technology as organ projection

Ernst Kapp (1808-1896), was one of the earliest philosophers to explicitly pursue a philosophy of technology.[4] Kapp echoes Hegelian sentiment when he argues that humanity is the centre of history and culture, standing in the middle of their 'geological beginnings and teleological future.'[5] However, he departs significantly from Hegel when he argues that cosmic history receives its meaning not through *Geist,* but by way of the promulgation of material culture through technology. In his principal work on technology, *Grundlinien: einer Philosophie der Technik* (1877), Kapp defines technology as a prosthetic extension (*Organprojection*) of the human person. [6] According to Kapp, since the days of 'pre-historic man'[7] humanity, through simple tools and language has sought to project Being into the world; extending our reach into the plane of the material and the cultural.

Prosthetic technologies were regarded by Kapp to be semi-corporeal extensions of human physiology which allowed humanity to expand into the unknown reaches of the world. *Grundlinien* is filled with illustrations that juxtapose anatomical drawings with engineering schematics, as a way of likening the human form with its equivalent representation in technological extensions. Cross sections of the veins and nerves of the human hand[8] are pictured alongside sewerage pipes and telegraph cables as a way of bolstering Kapp's unconventional thesis. Beyond the relatively simple anatomical comparisons (scissors as fingers, hammers as fists)[9], Kapp also

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[4] Carl Mitcham, *Thinking Through Technology: the Path Between Engineering and Philosophy* (Chicago: University of Chicago Press, 1994), 20.

[5]. Ernst Kapp, *Grundlinien einer Philosophie der Technik* (Braunschweig : Westermann, 1877), 39.

[6] *Ibid.,* 29-39.

[7] *Ibid.,* 29.

[8] For Kapp, of all of the organs of the human body which have served as a model for prostheses, the hand is the example *par excellence.* The hand, like any organ Kapp analogically reads the human body to find a tripartite meaning in any given organ. In the case of the hand, it is at one and the same time understood as a physiological entity which is connected with the workings of the body, as a model for other marketed tools (*merchanische Werkzeuge*) and as the means by which tools themselves are created, echoing Aristotle's sentiment that the hand is the 'tool of the tools' (*„das Werkzeug der Werkzeuge"*). *Ibid.,* 41.

[9] *Ibid.,* 45.

argues that the 'technologies' of cultural artefacts such as language, science and government find parallels in human cognitive function.[10] Through prostheses which extend from the human body and the human mind, Kapp believes man has been given the capacity to colonise both space and time by making material and cultural worlds which allow humankind to transgress beyond an innate dependence upon the natural environment.

For Kapp, every artefact reveals an underlying facet of one's essential self. To speak in ontological terms, the difference between tools and their users is merely a difference in material embodiment between, say, the essence of the hand and the essence of the scissor. The connection between tools (*-zeugen*) and organs (*Organ*) may at first seem an unlikely one, but Kapp seeks to argue on etymological grounds that the difference found in the conventional usage of the two words belies their linguistic resonances. The practical link between organs and tools led Kapp to posit that technology is a natural outpouring of the unconscious mind.[11]

As worlds of meaning are created by the human use of human-like tools, technology becomes the defining characteristic of human self-understanding. Kapp is dissatisfied in the power of mytho-poetic religious symbols, such as *Geist,* to act as the guiding forces of history and culture. Kapp would argue instead, that tools and techniques have eclipsed religion as the principle catalyst behind history, asserting that tools should themselves be understood as the 'spiritual children' of humanity.[12] For Kapp, because human will and agency is extended through tools, the ultimate domination of history through technological means becomes the ultimate ends of human existence.

Marx – projection of will

Like Kapp, Marx (1818-1883) sought to translate Hegel's idealism into a form of materialism which was relevant to his situation within industrialised Europe. Whereas Kapp understood the technological domination of nature to be an essential facet of human culture and being, Marx was far more dubious about the implications of technologisation. Both interpreted technology as a form of prosthesis, yet for Marx the prosthesis of technology not only dominated nature, but in the form

[10] See Kapp's discussion of *Staatsorganismus. Ibid.,* 307-351.

[11] *Ibid.,* 155-164.

[12] *Ibid.,* 45.

of machine technologies it extended the dominative force of the bourgeois will over and against the proletariat worker.[13] If Kapp was concerned with establishing a quasi-ontological relationship between humanity and technology (arising from an analogical interpretation of technology), Marx was concerned with asserting a theory of technical *praxis* which read human being appositionally alongside technological implementation, driving back philosophy to its pre-Socratic origins in materiality and action.

In contrast to Hegel, Marx believed that it was one's place within the material world which was constitutive of human existence and destiny.[14] As a part of material existence, tools for Marx gave form and substance to human will and agency. Moreover, taken up in labour, mechanical, physical and chemical instruments could extend a worker's physiology, as 'nature becomes one of the organs of his activity, which he annexes to his own bodily organs.'[15] Yet by functioning as prosthetics of human organs, the worker's integration of his tools into his own actions implied that the worker no longer worked for himself. Tools carry with them a sense of agency and will which are invested within them by their originators. The worker who takes up another's tools is no longer in control of his own actions.

For Marx, although simple tools are akin to the organs of the body, using these tools (and especially using machine technology) ultimately violates the worker's subjectivity. Tools and machines are means used to attain specific ends that are defined by the owners and inventors of tools. The workers who use these tools give up their own ends and take on themselves the means-nature with which the tools and machines have been invested. Unlike Kapp, the actual end of technology is not the creation of a cultural world that is carved out of the natural. For Marx technology's true end is the objectification human worker.

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[13] Contrast this with Kapp's relatively positive vision of *Maschinentechnik* in Ernst Kapp, *Grundlinien einer Philosophie der Technik*, 165-208.

[14] As with other left-Hegelians, Marx sought to subvert the Hegelian dialectic by reprioritising the place of the material over the ideal. In short, Marx argues that 'the idea is nothing else than the material world reflected by the human mind and translated into forms of thought…' Karl Marx, 'Preface to the Second Edition', *Capital*, vol. 1 (London: Penguin, 1990), 102.

[15] *Ibid.*, 285.

Marx's philosophy of technology and labour is well illustrated by the Charlie Chaplain Film, *Modern Times* (1936) or the Fritz Lang film *Metropolis* (1927). In both cases one sees representations of an underclass that is forcibly divested of its will and agency in the service of the machines. Workers become, quite literally, cogs which merely facilitate machine action, as they are placed directly within the heart of the machines that they operate. The worker sacrifices his own agency by exhausting himself in the service of banal and indecipherable tasks. Of course, neither Marx's philosophy of labour nor Lang nor Chaplain's films assert that machine teleology emerges *ex nihilo*. In all three cases, it is the ruling class, the designers and owners of complex machine systems, who use technology to extend their own will and agency and to ultimately impose their will upon the lower classes. For Marx, labour becomes the locus of Hegelian objectification and alimentation, which are principally realised in light of the proletariat's experience with industrialised labour:

> What constitutes the alienation of labour? First, is the fact that labour is external to the worker, that is, that it does not belong to his essential being; that in his work, therefore, he does not affirm himself but denies himself, does not feel well but unhappy, does not freely develop his physical and mental energy, but mortifies his body and ruins his mind.[16]

The alienation experienced in industrialised labour leads to the objectification of the subject and the destruction of being. In this regard, one's work becomes external to one's being, or as Marx hyperbolically referred to it, work becomes a form of 'self-sacrifice' or 'mortification'. Through this death, one's innate ends are replaced by the externally promoted ends of the cycle of production. Thus, 'the worker's activity is not his spontaneous activity. It belongs to another. It is the loss of self.'[17] For Marx, the extension of an other's ends upon the worker is the destruction of the worker's subjectivity, whereby the labourer is forced to exist merely as an object among objects. Truly the worker has become the prosthesis of the tool, rather than the tool becoming the prosthesis of the worker.

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[16] Karl Marx and Frederick Engels, *Collected Works,* vol 3 (London: Lawrence and Wilshart, 1975), 274-7.
[17] *Ibid.*, 274-7.

Despite his concern over the ills of the modern technical society, Marx does not assert a completely dystopian vision of technology. He would agree that production and the use of technology is a positive reflection of human creativity: 'people are what they do.'[18] What is at issue for Marx is not technology *qua* technology, but technology *qua* objectification. Technology when used properly expresses the élan of humanity, yet this very élan is destroyed when production is emptied of its subjectively creative element through the industrialisation of labour. It is the calculating practices of industrialised technology and ergo technological thinking which is ultimately destructive.[19]

Marx's critique of technology centres on the socio-political dynamics which are the context in which the human-technology interchange occurs. His quasi-dystopian vision of the technological age is augmented by his equally utopian vision of a world free of destructive technological rationality. For Marx, freedom from dehumanising technologies is only possible by way of freedom from the capitalist society itself. Marx does not advocate a freedom from technology *per se*, as technology is surely used within the context of the productive and satisfying labour of the communist society. However, his escapist vision shies away from any hope of redemption for technology within modern society. In this way, Marx serves as a counterweight to the positive assessment of technology offered by Kapp, yet his solution is not an acceptable method for surviving within a technological age, as historical examples of communist ideology have so clearly proven. Nonetheless, Marx appears as a half-step removed from Kapp, and represents a significant

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[18] Gavin Kitching, *Karl Marx and the Philosophy of Praxis*. (London: Routledge, 1988), 21.

[19] Karl Marx and Frederick Engels, *The German Ideology* ed. C.J. Arthur (London: Lawrence and Wilshart, 1970), 42.

[21] Much like Ernst Kapp before him, Dessauer is virtually unknown to English readers. Were it not for his involvement in early developments in the science of radiology, Dessauer would likely have disappeared into the blackness of history. A high school drop out, at the young age of 19 Dessauer's precocious spirit lead him to establish VEIFA-Werke, an early manufacturer of x-ray technology. In spite of self-detrimental experiments with the burgeoning technology (he died from radiation burns), Dessauer led the way in therapeutic uses of x-rays for the treatment of disease. Carl Mitcham, *Thinking Through Technology: the Path Between Engineering and Philosophy* (Chicago: University of Chicago Press, 1994), 29.

development in ontological thinking about technology. Tools are no longer external to oneself: in the case of Kapp, they are projections of one's physical form, in the case of Marx they are extensions of another's will. Despite a left-Hegelian metaphysic, the language of a tool-ontology is beginning to emerge.

Dessauer - projections of the divine

In Friedrich Dessauer (1881-1963) an ontological reading of technology is taken yet another step further from those of Kapp and Marx, as in Dessauer tools are viewed as an extension of divine creativity that is channelled through human action.[21] Dessauer's position grounds technology in a collaboration between divine inspiration and human creativity.[22] His insistence that technology is a prosthesis of divine creativity which is employed by the hands and minds of a willing technologist would seem to be a return to a Medieval interpretation of technology as means of domination. Such a critique would be unjustly levied against Dessauer, who takes into consideration the need for the appropriateness of a technological creation to be coupled with a concern for the natural order. Though I would consider Dessauer to be a part of the Prosthetic School, I wish to illustrate here that his theological re-reading of technology may prove to be a helpful corrective to the dystopian and utopian excesses of Marx and Kapp, respectively.

Dessauer's work corrects the overtly leftist reading of technology given above in Kapp and Marx by offering a middle ground between the teleology of the Hegelian absolute and the teleology of Marxist materialism. Dessauer roots technology in divine creativity and views human inventors and users of technology as co-creators alongside God, who engage in this work through the creation of human technologies. Though technology serves human needs, it does so only in terms which are authenticated by divine imperative.

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[22] To be sure, at first blush Dessauer's philosophy appears to be an overly optimistic and perhaps even naïve interpretation of the technological essence. Since the early 20th century it has been difficult to retain an unabashed optimism in the positive effects of technological developments, leading most of the later philosophers of technology to either wrestle with technology as an ambiguous reality or in extreme cases, as a purely destructive force.

In Dessauer's first philosophical work, *Philosophie Der Technik: Das Problem der Realisierung*,[23] he sought to create a dialogue between technology, social theory, metaphysics and theology, as a way of establishing technology's place within the broader lifeworld.[24] To define technology, Dessauer began by analysing the 'everyday talk' about technology, which centred upon 'industrial manufacture and technical commodities.' Dissatisfied with the ability of these 'visible manifestation[s]' to reveal technology's 'essence', Dessauer posited that the key to understanding technology rested in the initial manifestation of a technological entity; at the point in which 'new forms are created for the first time'.[25] For Dessauer, 'the core of technology is invention. Everything is fundamentally contained therein, if not resolved into it.'[26] Yet creation occurs according to very specific parameters, and not everything which is technological reveals the essence of technology.

Even though technological essence comes from the Divine, Dessauer's philosophy of technology endeavoured to recover the meaning of technology at the location of its application within the service of human needs. Technology was neither an ethereal object created for an external end resing in the mind of the creator,,nor merely is it a means of domination, nor exclusively a means of revealing. Indeed, all three characteristics could conceivably be ascribed to technology – yet technology's principal characteristic was described by Dessauer in terms of its ability to work productively for the will of God on Earth.

To safeguard his understanding of technology, Dessauer defines four axioms by which he argues ethical technological developments must proceed. First, as an answer to human need, technology can only be purposed for ends that originate from outside of itself; it can never function as both means and ends, as this would rob technology of its curative and palliative ends.[27]

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[23] Published in 1927, the same year as Heidegger's *Being and Time.*

[24] Friedrich Dessauer, "Technology in Its Proper Sphere," in *Philosophy and Technology: Readings in the philosophical problems of technology* ed. Carl Mitcham and Robert Mackey (London: The Free Press, 1972), 317.

[25] *Ibid.*

[26] *Ibid.*, 318.

[27] *Ibid.*

Secondly, in addition to serving the needs of humanity, technology must also serve the laws of the natural world. Even though technology may facilitate humanity in overcoming certain natural laws, this can only be seen as a 'liberation from the bonds of natural law'[28] and not as a breach of the laws of physics as such.[29] Thirdly, no individual can purposefully control the inventive-technical act. Technological inventiveness occurs at the boundary of human conscious desires. The creative moment is born in the sub-conscious mind of the inventor, who puzzles about human need (in light of the laws of nature) and discovers technical solutions deep within the mind's eye.[30]

Fourthly, although technologies materialise within the synapse of the 'sphere of human purpose and human work with the sphere of possibility within the laws of nature,'[31] they do so as objects which are truly originary and heretofore unknown. Technologies are born into the 'world of experience' as something which has 'not previously occurred, with its own quality and its own power.'[32] The inventor actualises (and gives form to) unrealised potentialities. Yet, one wonders, where these unrealised potentialities originate from, and from which muse the inventor receives his or her ideas? Dessauer's fourth axiom reflects what he acknowledges to be the spiritual dimension of inventiveness: technology creates a way of seeing the world as it is *intended* by the mind of the Creator:

> An inventor's reunion with the object which in the first instance "has come to be" out of himself is an encounter of unprecedented experiential power. Of intense revelation. Worldly wisdom passes it by. The inventor does not view what has been gained from his creation (though not from it alone) with the feeling, "I have made you" – but, rather, with an "I have found you. you were already somewhere , and I had to seek you out for a long

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[28] *Ibid.*, 320.

[29] *Ibid.*, 318-21.

[30] *Ibid.*, 321-2. The intuitive element of technological creativity was also touched on by Ernst Kapp, who regarded inventiveness as a component of the sub-conscious mind. See: Kapp, *Grundlinien einer Philosophie der Technik,* 155-164.

[31] Dessauer, "Technology in Its Proper Sphere," 323.

[32] *Ibid.*, 323.

> time....You could not appear sooner, fulfilling your purpose, really functioning, until you were in my sight as you were in yourself, because that is the only way you could be....'[33]

The creative act, as a product of sublimated human consciousness, is a unique extension or prosthesis of divine creative activity in the world. The inventor is a participant in the creative process who merely uncovers that which is already existent in the mind of the continually creating God.[34] As participants in the creative activity of technology, inventiveness allows humankind to enter into 'a day of creation...caught up in it and renewed through observation, participation, and suffering.'[35] The revelation of divine creativity appears to the inventor as a 'rapture when after long effort the invention "comes".'[36]

According to Dessauer scholar Klaus Tuchel, the mind of the Creator 'precedes all technological realizations and founds the realm of pre-established solutions.'[37] For Dessauer, God himself is the ground and foundation of all technology. Thus, the creation of technology, as an extension of Divine creativity, is an activity which brings into harmony the biblical act of creation with the *creation continua*.[38] For Dessauer, the Creator has exclusive control over all human inventive activity, making the task of inventive discovery an event of participation between pre-existent divine ideas and human actions.

Though Dessauer's theological reading of technology offers an intriguing reinterpretation of the left-Hegelian prosthetic analogy, his greatest downfall is his unfailing optimism in technological progress. Though the essence of technology may originate in divine creativity, it

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[33] *Ibid.*

[34] One wonders if Dessauer's vocational work as a radiologist did not inform his philosophical and theological speculations. As x-rays, much like Bacon's lenses, allowed the technologist to peer into the hidden things of humanity – discovering what God had originally hidden – and facilitated the emergence of new technologies and inventions which would ultimately be beneficial to the plight of humanity.

[35] Mitcham, *Thinking Through Technology,* 32.

[36] Dessauer, "Technology in Its Proper Sphere," 327.

[37] Klaus Tuchel, "Friedrich Dessauer As Philosopher of Technology: Notes on His Dialogue With Jaspers and Heidegger," *Research in Philosophy and Technology*, 5 (1982), 270.

[38] *Ibid.*, 270.

seems to represent itself, for Dessauer, in the form of its unceasing progress. It was Dessauer's unfailing commitment to this positive vision of technology which made him an easy target for Karl Jaspers in *The Origin and Goal of History.* Jaspers understood technology purely as the 'interposition of means to the attainment of ends.'[39] Technology allows humanity to fashion the natural world into a suitable environment for habitation, it is a means of transforming the inhabitable wild into the habitable and controllable cultural world. According to Jaspers, by altering humanity's fundamental relationship with the world, technology has also augmented the basic relationships which constitute society. Thus, the technological society promotes a kind of future-minded rationality that destroys the depth of existence in favour of a two-dimensional technical rationality which exalts facts over reflection, production over quality.

In Jaspers estimate, Dessauer's naïve optimism is reminiscent of 19th century philosophies of technology, which, like Kapp's philosophy, were centred on the 'creative urge of the inventor'. Dessauer's theological interpretation of technology – which asserts that humanity has been empowered by virtue of being made in the Divine Image to fashion through technology a world of meaning – is judged by Jaspers as being incompatible with the nature of technology in the present world. As an alternative to Dessauer's optimism, Jaspers argues that technology is primarily a neutral medium which must be appropriated in culture with a certain degree of guarded pessimism. Although Jaspers would argue that 'technology is in the process of transforming man himself, along with his whole working existence,' he places the onus of responsibility upon the user of technology rather than technology itself: 'The fate of man depends upon the fashion in which he masters the consequences of technology for his life (from the arrangement of its whole structures, as it presents itself at any particular time, to personal conduct at every hour of the day'.[40] Certainly, though, this is not too far away from Dessauer's own philosophy, which attempted to secure the idea of a 'good' technology through the four axioms noted above. To be sure,

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[39] Karl Jaspers, *The Origin and Goal of History* (London: Routledge, 1953), 100.

[40] *Ibid.,* 124.

Dessauer's philosophy is riddled with a certain religious optimism about the nature and future of technology. Yet, to judge this optimism as unbridled naïveté seems an unfair critique.

Though not without his critics, Dessauer's philosophy of technology does bring to light some very intriguing possibilities for the relationship between theology and technology. If human technology is an extension of the divine will, unlike Jasper's assertion, technology can not be a means of rendering the artificial from natural. Rather, a technologist must exercise what Dessauer terms the 'inner working out' of the world, that is, through divinely inspired imagination the technologist reflects upon transcendent solutions to technically realisable problems. For Dessauer technology is a means of transcending the limitations of the Kantian critique of knowledge, with regards to empirical knowledge, as the technical imagination receives its insight from the Divine

> [T]technology opens an area of research to mankind that can furnish more information...in them we encounter the purposefulness which is a decisive part of their essence, and which eludes Kant's categorical adaptation which belongs to the power of judgment.'[41]

Enlisting Dessauer in the Summation and Critique of School

In the wake of the left-Hegelian subversion of *Geist* in favour of material culture and technology, technologies function for Kapp and Marx as extensions of human will and agency used to dominate either the natural world (Kapp) or the working classes (Marx). It would appear that this description of technology serves as a *de facto* means of self-'transcendence' which offers the left-Hegelian materialist metaphysic a language with which it can describe the human proclivity to pursue otherness (or the ultimate) apart from an appeal to anything truly transcendent. Yet, by asserting that technology can best be described in terms of human-tool projection or human-tool integration, technologies themselves become 'ontological' by virtue of their perceived source in human being and intention. Conversely, the prosthetic analogy implies that humans themselves become 'technological' because of their integration within complex technological systems. This close coupling of technology and human being frees technology from its grounding in actual technological practices and complicates if not obfuscates one's ability to arrive at an ethics of technological practice. Indeed, it is this move to unite tools and tool users which contributes to the

[41] *Ibid.*

essentialist reading of technology described below, and concordantly to the posthuman vision of human machine co-emergence described in the second section.

Though a member of the Prosthetic School, Frederick Dessauer offers a theological critique of the leftist reading of technology by introducing into the materialist metaphysic the centrality of divine self-disclosure. Because technological creativity originates in the Divine, Dessauer argues for an ethics of technological practice which takes into consideration the need for technologies to serve external ends and for technological inventiveness to be mindful of the laws of nature. By liberating technology from its ontological dependence upon humanity, Dessauer's contribution to the Prosthetic School provides a necessary space for an ethics of technological practices to emerge. This is precisely the kind of perspective which will be necessary in the hermeneutic philosophy of technology advocated below. Furthermore, the inclusion of the Divine into the act of human creative inventiveness potentially broadens the hermeneutic lens by which our analysis of technology proceeds. In effect, Dessauer's philosophy gives precedent to the inclusion of theological concern into the cultural, historical, material, and natural context from which technology emerges.

The Essentialist School

Though an ontological reading of technology has roots in the Prosthetic School described above, this position takes on fuller expression in the Essentialist School as typified by the works of the later-Heidegger, Jacques Ellul and Albert Borgmann. The common thread shared by these three voices is a conviction that technology possesses an essential nature which defies human control or curtailment. The only option for correcting this essence is either a retreat to a pre-modern understanding of technology (Heidegger), a passive resignation for a new epoch in world history (Ellul) or the subversion of the technological essence through a counter-cultural ethic (Borgmann). Though essentialists seek to avoid technology's cultural impact, there is no attempt on their part to seek a redemption of technology itself.

We have seen in the preceding discussion that over time thinking about technology shifts its focus from technologies themselves to a more reified discussion of technological essences, described in terms of the subjective affect of technologies upon their users. The gradual

internalisation of technology from Kapp, to Marx, to Dessauer comes to a head in Heidegger, whose pursuit of the 'essence' of technology leads him down a dystopian anti-technology path, on which he is followed by Jacques Ellul and Albert Borgmann.

Heidegger – essence of technology is revealing/en-framing

Heidegger's argument is based on the premise that in a 'technological world' practices are mediated through material forms that range from high-art to the engineering sciences.[42] Heidegger understood practices to serve as meaning bearing actions which communicated information about one's essential self and which operated corporately to transmit shared meaning about a society in general. As Heidegger scholar and IT philosopher Hubert Dreyfus writes, 'the only way to have a meaningful life in the present age...is to let your involvement become definitive of reality for you.'[43] Yet, one's involvement in practices, whether individual or corporate, is not necessarily always the bearer of positive meaning. Heidegger expresses concern that some actions may also be the bearers of nihilism, with the ability to remove meaning (or intentionality) from a subject or a society. Thus, in his later work, the 'Question concerning technology', Heidegger steps away from the relatively positive reading of the tool/tool-user relationship that was described in *Being and Time* to examine how tool-use problematises what he sees to be the pursuit of authentic subjectivity.[44]

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[42] Although the 'Question concerning technology' is not concerned with IT or computer science, it still merits an examination here. Heidegger's work is central to later discussions of technological essentialism and is perhaps among the most important documents in the philosophy of technology from the previous century. In order to understand the ethos of technological essentialism, we must first begin with Heidegger.

[43] Hubert L. Dreyfus, "Heidegger on the Connection Between Nihilism, Art, Technology and Politics," in *The Cambridge Companion to Heidegger* ed. Charles Guignon (Cambridge: Cambridge University Press, 1993), 291.

[44] Although Heidegger reflected on the nature of tools and tool-use in *Being and Time,* for the purposes of this thesis my discussion of Heidegger's technology writings will be limited to his 'Question concerning technology'. To be sure, Heidegger's hammer of *Being and Time* is a central metaphor employed in philosophical studies of technology and is often referred to when describing the nature of intentionality acted out over a material object. Yet, because this thesis is not purely a philosophy of technology and because his early work is arguably about tools and tool-use more than it is about

Heidegger approaches 'The question concerning technology' (1954) in connection with two other 'questioning essays': 'The Question of Being' (1955) and 'The Question of the Thing' (1967). Questioning is an enterprise worthy of respect. Indeed for Heidegger, 'questioning is the piety of thought'.[45] Heidegger's pursuit of questioning Being, Thingness, and Technology seeks to uncover his subject's essence or fundamental ontology by discovering how things, being and technology are revealed in the world via a process of investigation. Like a true Socratic, Heidegger will pose to his reader such questions, but will only allow the answer to appear through the reader's own deduction.

Heidegger begins his essay by admitting to the ubiquity of contemporary technologies, noting that the human condition is one which is inextricably 'chained to technology', regardless of whether one is for or against it. This bondage is intensified when one fails to explicitly regard technology's presence in the lifeworld:

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technology as such, the later work has greater relevance. Nonetheless, in this extended footnote a brief comment on *Being and Time* is warranted for the sake of thoroughness.

There are two areas of *Being and Time* where Heidegger addresses issues pertaining to technology. The first is through his discussions of the hammer in his 'Analysis of Environmentality and Worldliness in General' (I.A) and the second is found in the section entitled 'The Temporality of Being-in-the-World and the Problem of the Transcendence of the World' (II.iv.69). It would seem for Heidegger in *Being and Time* that this functional analysis of tools shows that not all hammers are created equal. Heidegger on several occasions uses the 'hammer' as a useful image for describing a variety of topics, not simply for tools and tool-use. In the sections mentioned above, the hammer is referred to as a tool yet in other places it is referred to as an example of a weighty object (154-5, 7; 360-1). Although hammers are considered to be 'tools' (*Werkzeug*), as objects which are designated for particular work, they are more often than not considered to be 'useful things' (*Zueg*) – in light of his understanding of 'toolness' and instrumentality. The 1962 English edition of *Being and Time* (translated by John Macquarrie and Edward Robinson) notes the ambiguity found in translating Heidegger's use of *Zueg* into English. They state that the word has 'no precise English equivalent. While it may mean any implement, instrument, or tool, Heidegger uses it for the most part as a collective noun which is analogous to our relatively specific 'gear' (as in 'gear' for fishing)...For the most part Heidegger uses the term as a collective noun, so that he can say that there is no such thing as '*an* equipment'...' Martin Heidegger, *Being and Time*, trans. John Macquarrie & Edward Robinson (San Francisco: Harpers, 1962), 92n1.

[45] Martin Heidegger, "The Question Concerning Technology," in *Basic Writings* ed. David Farrell Krell (San Francisco: Harpers, 1993), 341.

> We are delivered over to it in the worst possible way when we regard it as something neutral; for this conception of it, to which today we particularly like to do homage, makes us utterly blind to the essence of technology.[46]

In the 'Question concerning technology' Heidegger seeks to determine if the use of modern technology offers the same value-bearing function as other shared practices, or if technology's essence proves it to be something which ultimately leads to nihilism. Heidegger begins his attempt to establish technology's essence by ascribing to technology a particular definition: technology is tantamount to revealing. He argues for this along three lines: First, he attempts to find the essence of technology by reducing technology to its fundamental being. This is done through an analysis of one's ontic encounter with technology, in terms of both technological practices and with respect to technology's etymology. Secondly, he identifies the uniquely ambiguous nature of modern technology which shows itself to be both a negative and a positive force. Thirdly, he concludes that the problem with contemporary technology is not exclusively a problem with the effects of technologies themselves, but more generally a problem with the means by which technology imposes upon the world a particular mode of revealing. Modern technology, inclusive of instrumental and causal technologies, challenges one's pre-technological way of knowing the world by revealing a world that is primarily understood in terms of its relationship to technology.[47] Thus, technology is neither a means-ends system, human activity, nor exclusively the application of scientific theory.[48] For Heidegger, the use and creation of technology itself is an introduction into the world of a new way of envisioning the world.[49]

He writes that the danger inherent within contemporary technology can be contrasted with the relatively benign nature of pre-modern handicraft technologies. Whereas ancient *techne* or handicraft stemmed from an organic relationship between humans and the natural world, contemporary technologies take hold of nature, forcing nature to conform to its own ends. For

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[46] *Ibid.*, 311-2.

[47] *Ibid.*, 318.

[48] *Ibid.*, 312.

[49] *Ibid.*, 318.

Heidegger, nature within the modern technological milieu is thwarted from its ability to function as an unmediated source of revealing. Thus, the principal way in which modern technologies challenge their users and their objects is by changing one's perceived relationship to the world through the application of a foreign teleology onto technology's natural object. The technological world ceases to be a world in and for itself because under technological mediation the world becomes controlled by technology's own teleology. This revealing is described as a king of 'en-framing', whereby the conveyance of truth is ever obscured by its mediation through technological ideologies.[50]

As his example, Heidegger examines the means by which contemporary technology takes hold of the natural world for the production of energy. Whereas the ancient modes of deriving energy were anchored to the underlying forces of nature, modern technology grasps hold of (en-frames) nature and compels it to submit to humanity's needs. For example, a hydro-electric dam challenges the status of a river as an aesthetic or natural object, and reduces it into a means of deriving electrical power. The scenario is much the same for the production of coal-fired electricity:

> A tract of land is challenged in the hauling out of coal and ore. The earth now reveals itself as a coal mining district, the soil as a mineral deposit. The field that the peasant formerly cultivated and set in order appears differently than it did when to set in order still meant to take care of and maintain.[51]

As a metaphor for modern technology as a whole, coal fuelled power stations show how modern technology forcibly draws from nature a foreign and imposed teleology, removing from nature what Heidegger would see as nature's natural ends.[52] As such, nature is revealed as a 'standing-

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[50] Yet, it would follow that technology still reveals, even though this revealing is based upon a false *logos*. Heidegger's thinking about technology could be occluded by Tillich's understanding of the ambiguous nature of technology, which can both be creative and demonic, depending on the type of logos which is implemented in the technical act. See: Paul Tillich, *Systematic Theology*, 3 vols., vol. 3 (Digswell Place, Welwyn, Herts, England: James Nisbet & Co. Ltd., 1964), 57.

[51] Heidegger, "The Question Concerning Technology," 320.

[52] *Ibid.*, 321.

reserve', and for Heidegger, 'whatever stands by in the sense of standing-reserve no longer stands over against us as object.' [53]

The transformative power of technology extends well beyond the physical sphere. Humanity and human history itself can join in the collateral damage of an en-framing type of technological thinking.[54] The individual within the technological system is reduced to merely a place of service within the whole. As Dreyfus says, '[n]o more do we have subjects turning nature into an object of exploitation',[55] as for Heidegger the subject-object relation is distorted as both the 'subject and the object are sucked up as standing reserves.' [56] If technological thinking is carried out in society at large, the destructive result will be a world in which things are only regarded on the basis of their potential for production. 'Thus where everything...exhibits itself in the light of a cause-effect coherence, even God, for representational thinking, can lose all that is exalted and holy, the mysteriousness of his distance.'[57]

As an inheritor of the romantic legacy, Heidegger laments that if nature is somehow removed from the gaze of human reflection, truth will be unable to come into being. According to a purely technological worldview, nature ceases to reveal anything to humanity that is not first mediated through the revealing of technology. [58] Overcoming the dangers of technology is concomitant with a return to a pre-modern understanding of the relationship between *techne* and *poiesis* as a conveyance of truth, derived in Heidegger from his reading of Plato. Society can escape from the dangers of technology if it retreats away from technology to the revealing offered through art (the most likely translation of *techne* in Attic Greek). It should come as no surprise that Heidegger's resolution to the problem of technology is an appeal to poetics and fine arts. After all, the

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[53] *Ibid.,* 322.

[54] *Ibid.,* 329.

[55] Dreyfus, "Heidegger on the Connection Between Nihilism, Art, Technology and Politics," 306.

[56] Martin Heidegger, 'Question Concerning Technology', 173 quoted by Dreyfus, "Heidegger on the Connection Between Nihilism, Art, Technology and Politics," 306.

[57] Heidegger, "The Question Concerning Technology," 331.

[58] *Ibid.,* 322.

'Question concerning technology' is based on lectures given by Heidegger at the Bremen Club in December 1949 and the Bavarian Academy of Fine Arts in 1953.[59]

For Heidegger, technological thinking has already 'afflicted man in his essence. The rule of enframing threatens man with the possibility that it could be denied to him to enter in more original revealing and hence to experience the call of a more primal truth.'[60] In light of the present situation, one wonders if there is any semblance of hope for the modern technological world in Heidegger's vision of technology. Has the technological essence so ensconced itself in modern life that there is essentially no hope for redemption?[61] Is there a way that we can retain the technological artefacts which texture our lives, while still allowing ourselves to experience unmediated revealings? Frankly, it is difficult to assess whether Heidegger is truly the Luddite dystopian that the 'Question concerning technology' makes him out to be. Though nowhere does he unilaterally condemn the use or development of technology, he still posits as his solution to technological revealing a return to the pre-technological revealing of the *poiesis* of *techne*. For Heidegger, if truth is to be found in a technological society, it can only come through art. Modern technology mediates a false-poietics which can only be countered by one's return to high-culture. He laments the present corruption of the *poiesis-techne* relationship, noting that: 'once there was a time when the brining-forth of the true into the beautiful was called *techne*. The *poiesis* of the fine

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[59] Heidegger's turn to the arts signals a turn away from technology. Heidegger is not the first nor the only contemporary figure to note the antinomy between Science/Technology and the Arts in the mid-20th century west. C. P. Snow's, *The Two Cultures,* presented in 1959 as Rede Lectures, notes that science and literature represent two ways of looking at the world, yet their separation in contemporary intellectual and practical life portends a dangerous schism. He laments the breakdown of communication between the two, as a stumbling block to achieving a solution to the problem contemporary social ills. See: C. P. Snow, *The Two Cultures* (Cambridge: Cambridge University Press, 1993).

[60] *Ibid.,* 333.

[61] Dreyfus argues that Heidegger indeed leaves hope for our ability to keep technology and retain authenticity, though at least within the 'Question', it would appear that technology itself unredeemable in its en-framing. See: Hubert L. Dreyfus, "Heidegger on the Connection Between Nihilism, Art, Technology and Politics," 307.

arts was also called *techne*.'[62] Heidegger reserves hope for the future in terms of a return to *techne* as the handmaiden of *poiesis*.

I see two problems in Heidegger's critique of contemporary technology. First, I believe he incorrectly identifies what is merely a trait of technology (technology reveals) with the essence of technology (technology is revealing). This thesis argues that technology is not essential, but practical. Technology is defined hermeneutically at the nexus of design and application, ascribing to technology an essence reifies actual technologies and neuters human culture's ability to control its own produce. Secondly, by returning to the etymological heritage of technology, Heidegger's argument rests on the shaky foundations of an appeal to *techne* as an equivalent for technology. This smells of *argumentum ad antiquitatem*, a tendency which in chapter one was dismissed as being inherently fraught with difficulty.[63]

Ellul – the essence of technology is domination

Alongside Heidegger, Jacques Ellul is one of the most prominent critics of mid-20th century technology. Ellul was neither a philosopher nor a theologian, but came to the problem of technology primarily as a sociologist with a personal commitment to a liberal form of Protestantism

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[62] Heidegger, "The Question Concerning Technology," 315.

[63] Another useful critique of Heidegger's 'Question concerning technology' comes from Frederick Dessauer's later work, *Streit um die Technik.* He contrasts his own more theological-revelatory vision of technological ontology with later-Heidegger's secular-poetical understanding of the same. Dessauer argued that Heidegger's reading of technology was crippled by his inability to recognise technology's spiritual depths, as 'for decades it has often been observed, that technology is more than human doings and expedients.' (Dessauer, *Streit um die Technik,* 277). For Dessauer, technology reflects an aspect of metaphysical transcendence, which has been obscured by later-Heidegger. He believes that Heidegger's poetical reading of technology would receive significant assistance if he would pursue 'the step toward metaphysical explanation and religious analogy.' (Dessauer, *Streit um die Technik,* 361) The religious dimension of technology not only serves to allow technology to express the will of the divine creative mind, but it also allows humanity itself to actualise its own latent potentiality. Transcending the cycle of production and consumption and the process of industrialised manufacture; humanity realises its own essence by applying its will, knowledge and skill in the divinely orchestrated creative plan of invention. Citations from: Friedrich Dessauer, *Streit um die Technik,* 361 quoted by Klaus Tuchel, "Friedrich Dessauer As Philosopher of Technology: Notes on His Dialogue With Jaspers and Heidegger," 277.

which coloured his technological writings in an explicitly theological way. As a Christian activist, well before a 'theology of the city' became popularised in recent works such as Graham Ward's *Cities of God*, and before 'eco-theology' became a concept worthy of academic theological reflection, Ellul expressed a profoundly Christian theological critique of modern western culture in terms of social, environmental, political and metropolitan injustices. Primarily in his *The Technological Society* (1954), but also in the earlier *The Presence of the Kingdom* (1951) and the later *Hope in Time of Abandonment* (1972), Ellul's work portrays a liberal Protestant objection to what he saw as the dehumanizing essence of ubiquitous technique. .

Like Heidegger, Ellul was less concerned with technology as a material artefact and more concerned with technology as that which functions as the dominant mode of seeing the world. A technological society is not a society that necessarily employs complex technologies, but a society which thinks and acts technically and is controlled by a technical ethos which dominates the more amorphous religious and aesthetic dimensions of life. If Paul Tillich's theological method was considered to be a method of correlation, whereby the existential situation of the world was correlated to the answer provided in the message of the Christian *kerygma*, Jacques Ellul's method can be understood as a 'method of confrontation', whereby the practices of the church in relationship to the world are confronted by the ethical and practical demands of the Christian *Kerygma.*[64] Unlike Tillich, who sought to interpret and adapt the Christian message to the cultural situation, Ellul's primary concern was to judge culture's inadequacies. By returning to an almost primitive form of Biblicism that was combined with a strong emphasis on the apocalyptic challenge of Christianity posed to culture, Ellul encourages his reader to rise up in revolt against the 'suicidal' tendencies of modern society,

Ellul established in his early work, *The Presence of the Kingdom*, a confessionally theological agenda which permeated most of his work thereafter. To understand his solution for the problem of the contemporary technological society, his theological method must first be addressed. Ellul believed that the primary identity of the individual Christian was located in their public placement

[64] James Y. Holloway, "Review of the Betrayal of the West," *Theology Today*, 36, no. 1 (1979), 103.

within the world. 'The Bible tells us,' Ellul writes, 'that the Christian is in the world, and there he must remain.'[65] Echoing biblical sentiment, Ellul asserts that we live in a world which is the 'domain of the Prince of this world, of Satan.' As such, humanity (Christian or otherwise) is universally placed within the context of sin. '[W]ithout exception' and 'in spite of all our efforts and our piety we share in the sin of the world.'[66] Sharing in the life of the sinful world means that the call of the Christian in the world is to live out and realise in the 'most concrete way possible'[67] a religiously fuelled drive for social, economic, political and environmental justice which is in direct opposition to the way of the world at large. Ellul believed that 'it is in receiving, and in living the Gospel that political, economic and other questions can be solved.'[68]

Christian opposition to the world is viewed in quasi-apocalyptic terms by Ellul, and couched in his intentional use of the language of Christian eschatology. The war between the Kingdom of God and the Kingdom of World is fought within the everyday life of Christian action in support of the life-giving message of the *Kerygma.*[69] Ellul understands divine action to take place within Christian revolt against the world, as the divine activity of 'saving and preserving' the world is dialectically viewed as 'judgment and as pardon, as law and as grace, as commandment and as promise.'[70]

One of the primary aspects of conflict between these two kingdoms is found in their distinctive objects of worship. The Kingdom of God is centred on the worship of Christ which consists principally in perpetuating his will vis-à-vis social and political ethical practices. Conversely, the World's objects of worship are variously 'technics, the State, or production', which are at the heart of 'modern religion'.[71] In his later *Technological Society,* contemporary society's chief object of

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[65] Jacques Ellul, *The Presence of the Kingdom*, trans. Olive Wyon (London: SCM Press, 1951), 7.

[66] *Ibid.*, 16.

[67] *Ibid.*, 17.

[68] *Ibid.*, 18.

[69] *Ibid.*, 30-34.

[70] *Ibid.*, 27.

[71] *Ibid.*, 37. A 'fact' can be any positive assertion which connotes an object with determined veracity. Facts become for culture that which is both unquestioned and unquestionable. This hints at the underlying

worship is identified as the pursuit of technique, what in his earlier work is described as a system of means which reduces the subject into units of quantifiable usefulness. In a technological society, one's value is found in one's ability to produce and to contribute to the overall production of societal ends, making society itself a mirror of the very efficiency which its technologies are modelled upon.[72] By elevating usefulness and efficiency (quantitative concerns) over and above concern for quality of life, within the technological society humanity has lost sight of ultimate ends.[73]

The language of ultimacy is intentional here, as Ellul argues that in the technological society, technology has reach the point of religious significance: 'We dress technique in the aseptic mask of the surgeon. Impassivity is an attribute of the new god, as it was an attribute of the old.'[74] Through the religious object of technique, the technological society attempts to substitute one's existential and ontological needs with the immanence of material conveyances. This is precisely the problem which in this thesis is being identified with the techno-theology in the culture surrounding information technology, as evidenced in posthuman discourse. It would seem that Ellul's critique of technique in his own day, though of an essentialist orientation, continues to speaks to the current situation.

Like Heidegger who feared that technology would close-off the possibility for unmediated revealing from nature, Ellul fears for a day when technical mechanisms will be so advanced that humanity will completely withdraw from any sense of natural necessity. The lure of technique draws one into a purely material reality, which denies any alternative grounding or source of being.

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problem of the modern world; the elevation of the facticty over the subjectivity. Ellul argues that from a historical perspective, humanity has always recognised itself as the 'ends' of history with 'facts' acting as the means.

[72] *Ibid.*, 65.

[73] This sentiment is echoed in Edward Goodwin Ballard's, *Man and Technology: Toward the Measurement of a Culture* (Pittsburgh: Duquesne University Press, 1978).

[74] Jacques Ellul, *The Technological Society*, trans. John Wilkinson (London: Jonathan Cape, 1965), 389.

Progress becomes the new *mythos* of the technical age; the erotic draw of innovation becomes the new mode of 'sacred delirium.'[75]

For Ellul, the ideology of the technological society is one that directly reflects the patterns of efficiency and productivity that are established within industrial technologies. Echoing the sentiment of the Prosthetic School, Ellul writes that, 'when technique enters into every area of life, including the human, it ceases to be external to man and becomes his very substance.' He argues that technology reveals itself not through material artefacts, but through its autonomous force and the technical way of thinking; contact with technology demands the adaptation of a technological worldview. This Heideggerian sentiment is taken much further in Ellul who argues that modern technology is itself 'autonomous', in that 'it has fashioned an omnivorous world which obeys its own laws and which has renounced all tradition.'[76] Technology has broken with tradition, becoming its own ground and its own goal. In as much as it is autonomous, it is also self-determining. It exists in a closed circle, wherein its organisation only permits determination which is independent of all human interference. He sees technology as a system which must be addressed as such.[77]

In this damning vision of humanity's technological reality there is scant room for hope or promise. For Ellul in *The Technological Society* hope is mocked as it has 'no chance whatsoever of influencing technical evolution.'[78] The only resolution in the face of this technological juggernaut is a realistic awareness of the dangers, errors, difficulties and temptations posed to contemporary humanity living in the technical world. There is no possibility of turning back to a pre-technological era, nor is their hope that technical progress can be arrested. Nostalgia has no survival value in the technological society and can only be considered a flight into dreamland.[79] As

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[75] *Ibid.,* 192.

[76] *Ibid.,* 14.

[77] Jacques Ellul, "The Technological Order." *Philosophy and Technology: Readings in the Philosophical Problem of Technology.* Edited by M. Carl and R. Mackey, 86-105 New York: The Free Press, 1983, 86.

[78] Ellul, *The Technological Society*, 430.

[79] Ellul, "The Technological Order," 91.

the technical myth has fully taken over the west, there is no possibility for the philosophical or religious redemption of technology.[80]

The hopelessness found in the technical society is met with pessimistic hope in one of Ellul's later work, *Hope in a Time of Abandonment*, where he returns to the language of Christian eschatology as a response to what is perceived to be the evils of the technological society.

> Man feels caught in a snare, as though a lid had fallen over him at the very moment when the man-in-himself was breaking through the lid of the skies. He has felt closed in by an unyielding trap, just when everyone was catching the vision of a pleasant life for all.[81]

The rescue from this confinement is found only in a non-violent revolution[82] accomplished by a 'pure act of God....beyond our grasp, and beyond our ability to structure.'[83] Ellul's revolution is not only beyond our ability to structure, but beyond our ability to participate within. His non-violent revolution is a revolution that exists beyond the veil of the temporal horizon, at a time and space which are in the world of God's future activity. He does not reserve hope for the realisation of this theological-breaking-in, but rather asserts a hope which he stylises, 'pessimistic hope'; a hope which is set on the impossible, and which leads the forsaken-by-god to take matters into their own hands, through the subversion of the technological society.[84]

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[80] The contemporary antithesis to Ellul is the more conservative optimism of Jürgen Habermas, who argued that technology has positively transformed society through the means of increased communication networks, transportation, law, and even bureaucracy. Habermas conveys an intriguing critique of a technologically transformed society, which is perhaps more balanced than the purely pessimistic vision of Ellul. Rather than regarding the whole of society as tainted with the reified concept of 'technique', Habermas examines the 'sub-systems' of technological society, which create on an organic level a form of 'economic legitimation' which adapts and changes societal forms of 'rationalization'. These rationalizations exist dialectically 'from below' and 'from above.' Jürgen Habermas, *Toward a Rational Society: Student Protest, Science, and Politics.* (London: Heinemann, 1971), 98.

[81] Jacques Ellul, *Hope in Time of Abandonment*, trans. C. Edward Hopkin (New York: The Seabury Press, 1973), 4.

[82] See Jacques Ellul, *Violence: Reflections From a Christian Perspective*, trans. Cecilia Gaul Kings (London: CM Press, 1969), for his discussion of non-violent revolution in the spirit of Christian action.

[83] Ellul, *Hope in Time of Abandonment*, 226.

[84] *Ibid.*, 228.

> The challenge of hope is the introduction into a closed age, into a tight security, into an autocephalous organization, into an autonomous economic system, into totalitarian politics, of an opening, a breech, a heteronomy, an uncertainty, and a question.[85]

Ellul understands the zenith of all political action to be hope for the coming of the Kingdom of God. All modern revolution is read by Ellul through the revolutionary context of the first century Christians. The technological age must be overcome through pessimistic hope that fuels social action in subversion of the modern age.[86]

Though Ellul is correct in asserting that technology is something which cannot be escaped from, his eschatological pessimism leaves no room for the redemption of actual technologies. Typical of technological essentialism, a reified and abstracted form of technology has become for Ellul the central thrust of his critique, apart from any reference to actual technologies themselves. Indeed, the essentialism of his autonomous reading of technology forces technology to exist as a supernatural force which is incorrectly identified with the Kingdom of the World known primarily as that which is under judgment by the Kingdom of God. To close the door to a productive engagement between theonomy and technology is to regard all human creativity as somehow demonic. This is simply not an acceptable solution, especially for a thesis which contends that theology and culture share a fundamental relationship to the Ultimate.

Borgmann – the essence of technology is self-seeking

A more contemporary figure in the philosophy of technology, Albert Borgmann follows Heidegger and Ellul by maintaining that the social problems associated with technology are caused by a technological essence. Though Borgmann would agree with Heidegger that technology primarily facilitates a way of seeing the world, he would depart from either the primitivism of Heidegger or the pessimism of Ellul by advocating an ethical response to a technological society that counters the dominant technological systems with a renewed emphasis on core societal values.

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[85] *Ibid.*, 248.

[86] Ellul, *Hope in Time of Abandonment*, 306.

Like other Essentialists, Borgmann's overall thesis argues that contemporary culture has been marked by the indelible imprint of technology in all areas of productive and recreational life.[87] Likewise, Borgmann primarily discusses a reified understanding of Technology which is less manifested in individual processes, systems, devices or machines, and more precisely typified by a dominant means of perceiving the world through a technological lens.[88] This reified Technology challenges the way in which society constructs value, pursues education, and understands individual and cooperate identities. Reform in the face of technology comes by way of a revolt against the technological paradigm, though not against technologies themselves. What Borgmann terms as 'counter-forces' that resist the technological ethos, 'must be able to respect the legitimacy of the promise and to guard the indispensable and admirable accomplishments of technology.'[89]

Though a technological essentialist with a penchant for pre-industrial Native American technologies, Borgmann is not a Luddite. His project responds to the essence of technology by advocating critical discernment with respect to the use and application of technology within the world:

> To be human is to recognise and appropriate one's world. Hence the context of the uses to which technological work is devoted cannot in the need be denied...Medical technology provides healing and wholeness where otherwise there would be insufferable pain and crippling disfiguration. Media technology allows us to consider all things and to be enlightened about the world in an intelligent and compassionate way. But once restored to health and well informed, we are not able to take up life. And here it is not good to cling to the preparatory and the exceptional. Rather we must as: what kind of life have we secured for ourselves *typically and willingly?*'[90]

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[87] Albert Borgmann, *Technology and the Character of Contemporary Life: a Philosophical Inquiry* (Chicago: The University of Chicago Press, 1984), 1.

[88] *Ibid.*, 43.

[89] *Ibid.*, 153.

[90] *Ibid.*, 246.

What Borgmann is properly critiquing is the technological essence that imposes its own worldview upon society and thus compromising a society's pre-technological conception of the 'Good' – what Borgmann describes as a secular form of ultimate concern.[91]

> The critique of technology has two necessary and jointly sufficient conditions. The first is the existence of a concern of ultimate significance that one sees threatened by technology. The second is a profound regard for one's fellows. At least some matters of ultimate concern can be guarded and enjoyed in privacy. Hence a privacy viable ultimate concern would allow one to remain reticent if one did not care for others of this kind. If I am moved by a deep regard for others but have no concept of what should untimely concern them, again I would have no reason to speak up. But if there is something that I have experienced as greater than myself and of ultimate significance and if the welfare of humankind truly concerns me, then I will want to join the two concerns and act on that joint concern to ensure its welfare.'[92]

Ultimate concern for Borgmann is not an appeal to the Ultimate, Absolute, or Unconditioned. Instead, he calls for a secular understanding of ultimacy which arises from a communitarian ethic. Through an appeal to a pre-technological sensibility, individuals – and the societies of which they are members – are encouraged by Borgmann to rediscover their universal proclivity for enthusiasm, compassion, and concern for the future. In practice, Borgmann's definition of ultimate concern is voiced by the poetics of the arts and by the advocacy of politics. The free play of art and the altruism of politics (ideally, at least) stand in opposition to the essence of technology which is ever bent on increased order and productivity.[93]

Thus, technology for Borgmann must serve the ideals of the good life and cannot become an end to itself. Surely this is an ethic of technology that this thesis can support. However, it is one which Borgmann seems to abandon, with respect to the particular character of information technology, as is evidenced by his later work, *Holding on to Reality.* Whereas *Technology and the Character of Contemporary Life* was primarily concerned with reified technology, his more recent

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[91] Indeed, for Borgmann religion alone cannot confront a technological ethos because it must learn to acquiescence to the demands that science places upon it. *Ibid.,* 26, 29.

[92] *Ibid.,* 176.

[93] *Ibid.,* 179.

work discusses the particular nature of information technology and treats with great suspicion what he calls the 'technologies of information'. Here, he laments the rise of virtual culture (concomitant with technological information) and the corresponding degradation of natural and cultural information.

For Borgmann, natural information is information which is based in and about reality. It appears to humanity in humanity's relationship to the natural world, in the use of the natural world to create signs, and in reading within the natural world patterns which contribute to the understanding of community and language. Cultural information is information which is put in the service of making a better reality. In this context, the 'language' that is derived from natural information language becomes writing, grammar, and eventually mathematics. With the abstraction of nature through cultural information, the natural world becomes quantifiable, and information becomes something which can be transferred and applied through reading, recreating, and constructing. Though Borgmann holds both Natural and Cultural Information in high regard, he is far more concerned about the impact of Technological Information, which he says inappropriately represents itself as information that *is* reality. What he describes here is very similar to what I regard to be cybernetic totalism. Yet where I would argue that cybernetic totalism is a disposition towards reality that is fuelled by a misreading of information technology in the context of an essentialist philosophy of technology, Borgmann would argue that technological information is a form of information which competes with, rather than emerges from, real-reality. With Borgmann, we see the 'virtual' reality facilitated by information technology existing as a counterpoint to 'real' reality facilitated by cultural and natural information.

> Whatever is touched by information technology detaches itself from its foundation and retains a bond to its origin that is no more substantial that the Hope diamond's tie to the mine where it was found.[94]

In keeping with his Heideggerian leanings, Borgmann maintains that technology is primarily a means of seeing the world. Accordingly, information technology promotes a particular way of

[94] Albert Borgmann, *Holding on to Reality: the Nature of Information at the Turn of the Millennium* (Chicago: University of Chicago Press, 1999), 5.

understanding information, which disrupts the relationship between sign and signified. It would seem though, that by creating a new way of seeing the world, Borgmann would argue that technology is creating another kind of parallel world which is juxtaposed with the pre-technological world. He would see that the appearance of a virtual world implies a disconnect between sign and signified which leaves one unaware of the relative freedom that a 'virtual' object has in relationship to its 'real' counterpart. According to Borgmann, IT seeks to uphold the reality of the virtual world, even though the virtual has no connection to the real. It is in this light that Borgmann can lament such online phenomena as chat rooms or virtual museums where personalities, artefacts, or places are unwittingly transduced from tangible realities into intangible fantasies.

IT's essence is identified with its ability to transform its objects and its propensity to reveal reality through a new (and he would argue, inauthentic) mode of viewing the world.[95] To overcome the dominant mode of revealing facilitated by IT, Borgmann advocates a partial withdrawal from IT culture.

> Righting the balance of information and reality is the crucial task. It amounts to the restoration of eminent natural information...As for technological information, there is no sense in trying to channel its development through narrow proscriptions or prescriptions. Nor does it make sense, of course, to let it run wild and overrun nature and culture. It is best allowed to develop freely within a world whose natural and cultural ecologies are guarded and engaged in their own right.[96]

Summation and Critique

Borgmann signals what is the principal problem raised by technological essentialism for a Christian theology of technology. By reifying information technology – separating the affect of IT from the products of IT – Borgmann's critique fails to regard technology, inclusive of information technology, as something which is a product of human creativity. Doing so, removes information

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[95] Borgmann's project cannot be faulted for its desire to retain a high regard for information and hermeneutics. Despite the technological essentialism his insistence on an ethics and theory of information which reflect a culturally rooted concern for the good life and a equilibrium within information theory that balances signs and the things they represent, is a noble task.

[96] Borgmann, *Holding on to Reality,* 221.

technology and the 'virtual reality' which it facilitates from its grounding within culture. IT and virtual reality are not a parody of nature, or the creation of a new metaphysics, but rather a product of the existing natural world. As will be described more fully in chapter five, with respect Graham Ward's description of virtual reality in the *Cities of God,* IT is little more than a culturally-created subset of the natural world. It possesses an ontological-weight, only when its origins in human culture are neglected and its mysterious operations are confused with the supernatural. In an attempt to overcome cybernetic totalism, Borgmann gives into technological essentialism.[97] Certainly, I agree with Borgmann that the 'engagement of reality is the proximate remedy'[98] for cybernetic totalism, but his cure comes at the price of adopting an essentialist understanding of technology. Here, Ellul proves to be a useful counterpoint to Borgmann, in that he reminds the reader that there is no escaping from the technological world.

To summarise this chapter's aims, according to the Essentialist School, technology possesses a definitive potential for transforming both its users and the societies in which it is employed. In the work of those noted above, if freedom is to be found from the technological essence, it can only come by way of a retreat from technology, or at best, the creation of strict laws which marshal technological control. Yet in appealing for an essence of technology, these commentators stymie any attempt to arrive at an ethics of technological practices or a notion of technological appropriateness. By regarding technology as possessing an essence, technology becomes for those noted above a determined and determining facet of contemporary life. If, as this thesis has argued, a theology of technology is to be approached, technology must be regarded as a redeemable facet of human culture and society. To advance some kind of ethical challenge to technological

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[97] An important counter to this would be theories of embodied and social computing, which seek to make the 'virtual' world and the 'real' world co-exist together. Thus, technology serves the needs of the life-world and does not merely constitute another world. With respect to a philosophy of information technology this is the thesis of N. Katherine Hayles, *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature and Informatics* (Chicago: The University of Chicago Press, 1999); in regards to the nuts and bolts of this kind of implementation, see: Paul Dourish, *Where the Action Is : The Foundations of Embodied Interaction* (London: MIT Press, 2001).

[98] Borgmann, *Holding on to Reality,* 233.

practices, I argue that technology cannot derive its meaning from human ontology, divine right, or its own independent essence. To understand technology we cannot turn to a reified essence, but must instead approach the actual technologies themselves and look at their use and appropriation within the world. Thus, technology can only truly be understood hermeneutically, at the nexus of invention and use.

Chapter 3: The Theology of Technology and the Hermeneutic Turn

In the previous chapters, we have engaged with key developments in the philosophy of technology as they have contributed to technological essentialism. In chapters four and five, we will note how technological essentialism contributes to the rise of cybernetic totalism, which in the cultural sphere contributes to the techno-theology evidenced in posthuman discourse, as described in section two. Before engaging with the specific details of the cultural, philosophical and theological implications of information technology, in this brief chapter an alternative to technological essentialism will be posited in the form of a hermeneutic approach to technology.

Technological essentialism fails to seriously regard the actual technologies which contribute to the perceived 'technological essence.' In the hermeneutics of technology described below, I wish to encourage subsuming the cultural appropriation of technology underneath technology's material and historical context. This is not to say that the cultural value of technology is to be disparaged in contrast to the material, but that the material and historical dimension to technology must be considered first, in order to ground the appropriation of technology within an ethics of technological practice. Unfettered from its material and historical context, technologies become reified Technologies, and in their reification escape critique, control, or redemption.

By employing utopian and dystopian language, the mistaken philosophies of technology discussed in the preceding chapters and echoed in the posthuman discourse of section two, shift the ethical engagement with technology away from technologies themselves. In so doing, the concerns which underpin these philosophies do not adequately engage issues arising from technology or technology-use, but merely reflect broader cultural fears. These fears reflect a poorly informed 'mythological' reading of technologies, which promotes technology as either the saviour of humanity or as the harbinger of social destruction. If this approach were hermeneutic and sufficiently realistic, productive and redemptive comment could follow. In this chapter, I hope to signal a turn to hermeneutic realism which seeks to discover technology's context in the life world,

determine the subject's place within technology-use, and offer a constructive critique of technology judged against culturally determined strong values.[1]

The Hermeneutic Turn

The alternative philosophy of technology advanced in this chapter resists pursuing an ontology of technology or a technological essence, in favour of a hermeneutic approach to defining technology. My work here rests upon the technology writings of Paul Tillich, the philosophy of technology advanced by the hermeneutic phenomenologist Don Ihde, and the social-critical approach to technology advocated by Andrew Feenberg. Following their example, this chapter will discuss three facets of the hermeneutic approach to technology: technological ambiguity; the role of practices in determining the meaning of technology, and the place of critique within cultural and societal reflections upon technology.

A hermeneutics of technology takes as its text the practices and produce of a particular technology, taking as its situation the many facets of a technology's developments and appropriations within a given culture. For this reason, in pursuing a hermeneutics of technology we will need to deal thoroughly with the history, materiality, philosophy, and cultural appropriation of information technology. Contemporary technology's situation is vast, but it must be accounted for in order for the meaning of a technology to emerge. A monochromatic vision of technology yields a miserably incomplete picture of the nature of the contemporary situation with technology.

A theology of technology adopts the hermeneutics of technology, taking as normative the message of the Christian kerygma. This message, as has been described previously, places at the centre the proclamation of Jesus Christ, the revelation of God incarnate, the teaching and tradition of the church, and the place of identity formation within community. This collection of meaning bearing symbols is brought to the task of defining technology and seeks to place technology under

[1] As a note, my emphasis on realism does not imply that the imaginary is unable offer a creative insight in the creation of an ethics of technology or a theology of technology. Indeed, the fictive, as will be discussed in section two, provides a theology of technology with a mirror by which actual technological practices can be assessed, problematized, and adjudicated. Yet, the merit of this mirror is found in its ability to spur on a real change and effect in a culture's engagement with technology.

the judgment and promise of the *kerygma*, allowing for the meaning of technology to give rise to an ethical response towards technology.

Technological Ambiguity: Tillich

Between 1928 and his death in 1965, Tillich produced a number of essays[2] and lectures[3] which explored the relationship between science/technology and theology/culture. His philosophy of technology emphasises the ambiguous nature of technology's use and encourages the kind of hermeneutic sensitivity to technological practices that is advocated in Don Ihde's project, as noted below. For Tillich, technology – as with any object within the multidimensional unity of existence – can only successfully be approached through a full awareness of its inherent ambiguity, inasmuch as the use of technology can either facilitate the revealing of the creative spirit or the appearance of destructive demonic. Though technology itself may be neutral, for Tillich, its use never is. The manifestation of either creativity or demonism depends upon technology's use, appropriation and context. We will discuss below the ambiguous use of modern technology that is framed by Tillich in terms of the tension between technology and creativity, and technology and the affirmation of the good life.

Ambiguity in Technology and Creativity

For Tillich, technology is concerned with progressive development, that is, the *formation* (*gestaltende*) of systematic wholes and the systematic wholes (*gestalten*) themselves. In this light,

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[2] Paul Tillich, "Wissenschaft" in *Die Religion in Geschichte und Gegenwart* ed. Hermann Gunkel and Leopold Zsarhack (Tubingen: Mohr, 1931); "Science and Theology: A Discussion with Einstein (1940)" in *Theology of Culture* ed. Robert C. Kimbll (London: Oxford University Press 1959), 127-32; "Nature and Sacrament (1942)" in *The Protestant Era* trans. James Luther Adams (Chicago: University of Chicago Press, 1948), 94-114.

[3] According to the Bibliography from the J. Mark Thomas edited compendium *The Spiritual Situation in Our Technical Society* (Macon, Georgia: Mercer University Press, 1988), 201-08, during this time period Tillich gave the following lectures on the relationship between science and theology: "Freedom of Science" University of Frankfurt (1932); "The Doctrine of Man and the Scientific Knowledge of Today" Yale University (1935); "The Tragedy of Autonomous Reason in the Growth of Industrial Society" Annual Minister's Convocation, Wilbraham Academy (1946); "Religion and the Social Sciences" Upsala College, East Orange, New Jersey (1949); "Man in Late Industrial Society" Christian Frontier Council, Windsor (1952)

it would seem that the relationship between spirit and technology reveals a 'creative spiritual function', yet upon closer analysis, Tillich argues that, 'in technology, spirit does not determine itself; it determines being, which is alien to it.'[4] Despite the appearance of creative freedom within technological acts, when 'goal gestalts' are posited they are subject to the empirical sciences. Creativity, in this sense, is not unhindered, but subject to foreign teleology and foreign laws. But, what does creativity mean in this sense? Earlier in the *System of the Sciences,* Tillich refers to creativity as an action of the spirit,[5] yet later in the same work, this spiritual role is diminished when creativity occurs within the confines of technology and the sciences. For Tillich, technological creativity is qualitatively different from other means by which creativity is explored, for example, in the arts or literature. Because technology always relies upon some underlying material substance, it is not creation out of nothing but the material instantiation of ideas into pre-existing substances.[6]

The 'reality' which is shaped by technology is a reality that is moulded by the imposition of foreign goals. Such goals reflect the immanent nature of technology and as such reveal technology's orientation towards the needs of the shifting-present. Tillich believed that this was what prohibited technical *innovation* from becoming true *creativity.* The distinction between the two is grounded in the fact that 'invention is in principle *subject to obsolescence,* while creation is inherently infinite and can become obsolete only on its technical side, never on its creative side.'[7] Transcendent teleology is always directed towards an unbounded goal. In the case of art, this leads to pure creativity, but in regards to technology, later-Tillich will see this as the cause of technology's quasi-autonomous rationality.

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[4] Paul Tillich, *The System of the Sciences According to Objects and Methods*, trans. Paul Wiebe (Lewisburg: Bucknell University Press, 1981), 105.

[5] *Ibid.,* 100.

[6] The productive activity of technology can be best understood in contrast to the productive activities of other sciences: 'In the sciences of thought, the object of knowledge is *found;* in the pure empirical sciences, it is *discovered*; in the technical sciences, it is *invented*; and in the human sciences, it is *created.* These terms correspond exactly to the cognitive attitude and the procedure of knowledge within the various areas.' *Ibid.,* 105-6.

[7] *Ibid.,* 106.

Whereas technology, in its ideal form, exists as an embodiment of calculation reflected in a given goal, in reality this reflection is often superseded by forms of 'instinctive, acquired, and inherited *praxis*. And *praxis* retains its position even when science has been in effect for the longest time.'[8] In this regard, Tillich argues that technology is always in conflict with its ideal self; existing as neither pure theory nor pure *praxis*. Within the technical act, '*science and craftsmanship* both cooperate and contend with each other.'[9] Technology is in one regard purely a manifestation of scientific rationality, designed to impose heterogeneous goals upon materiality in what is seen as a potentially autogenous manner. Yet technology also appeals beyond the sciences to a more spiritual dimension, whereby instinct transforms calculative *praxis* into an artistic form of craftsmanship. For Tillich of *The System of the Sciences*, technologies are ever competing against themselves as they partake in both the rationalism of the sciences and the creativity of craftsmanship. As neither purely science nor craft, technology escapes an analysis which is grounded in either rubric. To understand the significance of technology, however, Tillich appeals to its spiritual or creative dimension, to discuss how technology contributes to a culture's interpretation of what constitutes the 'good life'.

Ambiguity of Technology and the Good life

The *logos* of technology reveals a gestalt which is purposed from the point of the subjective user of technology and is applied to either the organic (natural) world or the inorganic (physical) world by way of either developmental, transformational or actualising technologies.[10] The way in which technology is used, and not the means of technology itself, is for Tillich the determining factor for technology's ethical appropriateness. Tillich will argue that technology itself is essentially neutral, but that it is the use of technology which determines its ethical value. Much

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[8] *Ibid.*, 106.

[9] *Ibid.*, 107.

[10] These three categories are used here by Tillich to refer to three types of technology. He echoes this also in Paul Tillich, *Systematic Theology*, 3 vols., vol. 3 (Digswell Place, Welwyn, Herts, England: James Nisbet & Co. Ltd., 1964), 79.

like Jaspers,[11] for Tillich it is up to the user to determine what constitutes a positive or negative technological practice.[12]

An example of this is seen in how technology approaches nature and habitation. Technology not only challenges nature into taking on a habitable form, but it does so by emptying nature of any uncertainty or unpredictability. Through the 'union of technology and science, humankind has subjugated the earth, has made the whole earth into a house for itself...just as the utopians at the time of the Renaissance predicted.'[13] The contemporary habitat of the 'technical city', may have created a quasi-utopian dwelling place for modern humanity, but the vastness and ever increasing size of the 'technical city' has created a shadow of the uncanny. For Tillich, the uncanny as that which is both familiar and unfamiliar, evokes an angst that is found in the uncontrolled and uncontrollable facets of modern technical cultures, and is given expression in the deeply rooted fear of over-control and the loss of freedom. This theme is broadly explored in the literature of social criticism and in novels such as Huxley's *Brave New World,* Orwell's *1984,* or more recently cyber-punk novels such as William Gibson's *Neuromancer* or Neil Stephenson's *Snow Crash.* In such tales, humanity's factual desire to tame nature reveals within technical culture the potential to subdue, repress, or tame the contingencies, freedoms, and fallibilities which are characteristics of a humanity that lives under the mark of fallenness.

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[11] Jaspers posited a vision of technology which landed somewhere between guarded pessimism and neutrality. Although Jaspers would argue that 'technology is in the process of transforming man himself, along with his whole working existence,' he places the onus of responsibility upon the user of technology rather than technology itself: 'The fate of man depends upon the fashion in which he masters the consequences of technology for his life (from the arrangement of its whole structures, as it presents itself at any particular time, to personal conduct at every hour of the day'. Karl Jaspers, *The Origin and Goal of Histor* (London: Routledge, 1953), 124.

[12] This is in contrast to the interpretation of Tillich offered by A. Arnold Wettstein who writes, 'a second aspect of our spiritual situation seen from a Tillichian perspective is that technology as a cultural form is not 'value-free' or neutral, a tool placed in human hands for good or ill as we choose, which is the position technologists conventionally assert.' A. Arnold Wettstein, "Re-viewing Tillich in a Technological Culture," in *Theonomy and Autonomy: Studies in Paul Tillich's Engagement with Modern Culture* ed. John J. Carey (Macon: Mercer University Press, 1984), 116.

[13] Paul Tillich, "The Technical Society As Symbol (1928)," in *The Spiritual Situation of our Technical Society* ed. J. Mark Thomas (Macon, Ga.: Mercer, 1988), 180.

In Tillich's reading of technology, one is left wondering if human technical capacity has spread so far that it is too vast for humanity itself to control.[14] Tillich answers this concern by stating the following:

> The technical thing has indeed lost its original uncanniness as a thing, but despite this it has not really become familiar...the thing has had its own life taken from it, and therefore no *eros* can unite it with our own life. It has become lifeless and it induces lifelessness in us.[15]

Away from the uncanny world of nature, immersed in the familiar yet unfamiliar world of the technical city, the lifelessness of the technical world has brought lifelessness to humanity at large. Tillich, in echoing a concern earlier voiced by Marx, wonders if by creating a world that humanity controls, it has not merely created a world whereby control is divested in the face of an 'emptied humanity condemned to be the servants of the servant of humankind.'[16] Thus, in the social sphere, we see that the 'lustre' and 'durability' of the technical city reveals a hidden and more veritable social dimension, which manifests itself in a yearning for theonomy expressed in a misplaced desire for ultimacy.

Tillich would argue that technology cannot provide the answers to the existential questions which those in a technical society are compelled to raise. Yet in its ambiguities it can point to questions for meaning which lead towards ultimate concern. Tillich asks, 'When...our whole life is spent in...service...to the technical city... what is the purpose of this life? The technical city gives no answer to this question, but it *poses* this question...'[17] The ambiguity of technology's use, and its malformed presentation of what constitutes the good life, points to the presence of a technological *mythos*. This *mythos* reveals itself to humanity in the form of a question that forces humankind to address what it means to exist in light of intuitive creativity. Recognition of this *mythos* is the key to fulfilment in a technological culture. Indeed, for early Tillich the only sin of technology is the sin of ignorance, that is, the sin which allows technology to continue – for good

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[14] This is also the line of questioning pursued in Graham Ward's *Cities of God.*

[15] Paul Tillich, "The Technical Society As Symbol (1928)," 183

[16] *Ibid.*

[17] *Ibid.*, 184.

or ill – without giving pause to reflect upon its implications. The danger in contemporary technology is found in its uncritical acceptance. Tillich challenges society to see the warning present in the existential situation of our technical age, and to be aware of both technology's benefits and technology's harms. In sum, Tillich promotes a hermeneutic and phenomenological appraisal of technology which seeks to find meaning in technology's situation and to self-reflexively examine the impact of technology upon presuppositional thinking.

The promises of technology are reflections of a universal hope for a good and just society. Tillich rightly sees within technology the redemptive potential, if used for theonomous purposes, to facilitate an image of the eschatological hopes rooted in the Christian symbol of the Kingdom of God. Technological production which leads to the reduction of labour serves the purpose of the Kingdom of God, reflects the underlying Spiritual Presence at work in creativity and is a forbearer of the ultimate end of all life, 'eternal life'.[18] Yet inasmuch as technology possesses beneficial potential, it also conveys the potential for destruction. If technical production is used purely as a means to its own ends, technology leads to gadgetry, which is in conflict with the selfless orientations of a theonomous culture. Technical self-limitation (a factor of a theonomous ethics of technology) governs the ethics of technical production and directs production to either increase or decrease, depending upon social norms which are external to the technological gestalt, and present within a theonomous culture.

For Tillich, life is lived in a multidimensional unity, yet all aspects of life are unified by the impact and effect (or affect) of the Spiritual Presence.[19] Even if one lived within the idealised theonomous culture, divining the intent of the Spiritual Presence regarding technology would still require a hermeneutics of technology, whereby the situation of technology could be analysed and the appropriateness of technological actions determined by an appeal to some normative model. In Tillich, apart from an appeal to theonomy, the practical ethics of technological practices are not fully explored. To interpret one's place in the technical city, or to determine right and appropriate

[18] Paul Tillich, *Systematic Theology*, 3 vols., vol. 3 (Digswell Place: James Nisbet & Co. Ltd., 1964), 275.
[19] *Ibid.*, 294.

action in a technological society, we must turn to Don Ihde's hermeneutic reading of technology in terms of embodied technological practices.

Meanings in practice: Ihde

Ihde's hermeneutic philosophy of technology is best expressed in terms of his work on instrumentation. Although explored fully in both *Instrumental Realism* and *Existential Technics*, his more recent *Bodies in Technology* summarises the importance of his hermeneutic approach to technology, with respect to the illusory mythic world conveyed by a faulty understanding of technologies.

Interpretation and Perception

Ihde argues that in order to understand technology, one must be able to determine the extent to which technologies modify the noumenal world as well as the extent which technology challenges the perceived phenomenal world. Ihde argues that when one employs an instrument to view something which by the naked eye is imperceptible, one fundamentally alters one's relationship to the perceived world.[20] Yet, does a change in perception result in a fundamental change to perception alone or to an underling ontology? Ihde offers a hermeneutic reading of this phenomena, which reflects the tool's ability to mediate an alternative (or fictive) world which exists alongside (and within) the lifeworld. Speaking of stargazing through a telescope, he writes:

> The thing seen is, simultaneously, the same as anything seen without the telescope in that it occupies the same location in...vision and the same size of optimum visual distance (through focusing the instrument), and yet it is radically different from eyeball vision without the telescope. This phenomenon is today a virtual constant of more than visual experience. The technological near distance of the communications technologies (elope, e-mail...) is a familiar new near-distant space.[21]

To explain the perceptual change which accompanies the use of mediating technological instruments, one must take up the practice of 'reading' instruments and technologies to determine

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[20] Don Ihde, *Bodies in Technology, Electronic Mediations* (Minneapolis: University of Minnesota Press, 2002), 46-7.

[21] *Ibid.*, 58.

the extent to which technological mediation challenges both the objective and subjective dimensions of the lifeworld. Instantiating a Kantian distinction between the noumenal and phenomenal world, Ihde argues that by creating a 'new near-distant space', technologies create opportunities for the application of new modes of seeing the world, which like texts, introduce the subject to new kinds of situational 'knowledges'.

Yet Ihde would note that the change from knowledge to particularised 'knowledges' is a result of the postmodern deconstruction of transcendentals and foundations, and their replacement by local knowledges and particularised knowledge practices. In this sense, postmodern knowledge is always a situated knowledge. To be situated, or to have a situated knowledge, is to have a form of knowledge which is embodied and located.[22] In this context, the technological mediation and extension of knowledge is a part of the broader pursuit of knowledge commensurate with one's natural ability to know and perceive the world.

The body within the technological context becomes the seat of the hermeneutic process by which knowledge is perceived and interpreted based upon one's situation. Yet, the body that is modified by technology is phenomenologically distinct from the technology free body. A body that exists in the world apart from the aid of technology formulates the situation differently from one which is immersed in, and mediated by, technology. One's technological body and one's non-technological body may still be the same 'essential' body, but the mediation of technology changes the way in which the world is interpreted. Thus, Ihde introduces the language of 'Body 1' and 'Body 2' to describe the difference between the non-technological body and the technology-emerged body. These are figured as the 'the reflexive body which is the condition for all situated knowledges' (Body 1) and the cultural or socially constructed body (Body 2) which interacts with the world through technological mediation.[23]

By distinguishing between Bodies 1 and 2, Ihde highlights the meditative effect of technology in creating the cultural sphere. He would argue that if hermeneutic phenomenology is at all self-

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[22] *Ibid.*, 68.

[23] *Ibid.*, 70.

reflexive, the mediation of technology must be included in the inward looking movement of reflexivity. Nonetheless, Ihde's technological self (Body 2) is not a self that is indeterminately changed, but a self that is challenged by cultural and technological pressures which both texture the form of the lifeworld and contribute to the moulding of the self. Thus, a hermeneutics of technology, for Ihde, can be identified with the process of self-reflexivity:

> Humans whether archaic or contemporarily scientific, undertake interpretation. Interpretation, reflexively self-interpretation, is an essential aspect of human being. This was Heidegger's insight. And interpretation in its very nature outstrips any particular metaphorical reification. Interpretation is transcendence. But interpretation as a phenomenon often remains hidden.'[24]

Though Ihde encourages critical reflection on the role of technology in challenging one's perception of both self and world, the move towards critiquing technologies, at least in *Bodies in Technology*, ceases to transgress beyond a paranaesis that admonishes a change in the way in which one perceives and engages with technologies. As central to contemporary philosophies of technology as Ihde's project is, he does not seek to redeem or reform technological practices in any socially significant or overtly compelling way. To move beyond observation, interpretation or reflection, we turn finally to Andrew Feenberg's critical approach to technological practices, as framed within his Marxist critique of labour.

Approaching Critique: Feenberg

Keeping in mind an awareness of the ambiguity of technology's use (Tillich) and the need to approach technology with an awareness of the subject's place within a technology-filled world (Ihde), Andrew Feenberg adopts a critical approach to technology which seeks to evaluate the ethics of technological practices by working within the two aforementioned philosophical considerations. Feenberg, as a thoroughgoing Marxist sees technology primarily in terms of its sublimation of the worker. Through his critical analysis of technology, he seeks to evoke a neo-socialist reformulation of technological implementation.

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[24] Don Ihde, *Existential Technics* (Albany, New York: State University of New York Press, 1983), 76.

Unlike Tillich, Feenberg does not regard technology as neutral, but sees it as an important facet of how culture expresses its political and social values. 'Modern technology...is no more neutral than medieval cathedrals...it embodies the values of a particular industrial civilisation and especially those of elites that rest their claims to hegemony on technical mastery.'[25] Yet although technology may be employed by the elite to control culture, Feenberg refuses to regard technology as something which is 'determined', and sees within our political and social engagement with technology the possibility of ethical critique. He escapes the determinist or essentialist philosophy of technology by shifting his focus away from the social ills which are caused by technologies, and centres his focus on the cultural ethos which fuels the appropriation of technology within contemporary life. He writes, 'the issue is not that machines have "taken over," but that in choosing to use them we make many unwitting commitments'.[26]

His is a 'critical theory of technology' which encourages a crossing over between the 'question of technology...customary in the humanities' to an incorporation with the 'contemporary world of technical expertise'.[27] Feenberg's approach brings the philosophy of technology into engagement with the material and historical context of technology in order to pursue an ethics of technology which are aimed at evoking real change. In contrast to Heidegger, Ellul or Borgmann, whose solution to the essence of technology is either a return to pre-technical craftsmanship, a hope for an eschatological release from technique or a change in social values, , Feenberg orients his constructive comments to the technologists themselves, in order to promote a more ethical form of technological development.

In light of Feenberg's critical theory of technology, it is not enough to only regard technology as ambiguous, or to simply situate oneself within the technologically mediated body. A truly productive (or redemptive) approach to technology must effect real change, in light of one's awareness of the technological situation and one's place within it. Apart from the promise of

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[25] Andrew Feenberg, *Transforming Technology: A Critical Theory Revisited* (Oxford: Oxford University Press, 2002), iii.

[26] *Ibid.*, 8.

[27] *Ibid.*, 13.

change, mere comment on technology dissolves to impotent theory. In line with the ethos of 'critical theory', Feenberg's 'critical theory of technology' prioritises the particular over the individual, and so attempts to explore a redemptive engagement with technology by focussing on actual uses of technology within society.[28] This, I believe, is the final piece in approaching a successful engagement between technology and theology within the cultural sphere. Following this example, in the conclusion of this thesis, having explored the technological situation in terms of its material, historical and cultural expressions, a redemptive engagement with technology will be encouraged in the form of a theology of technology, which roots human creativity within the theological symbols of creation and redemption.

Conclusion

I have pursued a hermeneutic philosophy of technology in response to technological essentialism for two reasons. First, technological essentialism, as a philosophical predisposition of the culture surrounding information technology, contributes to the elevation of technology to the point of ultimacy within the techno-theology of this culture. Secondly, technological essentialism closes the doors to a theological critique of technology by rejecting the possibility of a redemption *of* technology, in favour of a hope for freedom *from* technology. A theology of technology must assert that technology, like all creation, can benefit from the offer of justification and grace. The *kerygma*, if it is anything, is a message of universal redemption within the world, and not a call for redemption away from the world.

According to the hermeneutic philosophy of technology advanced here, to understand technology is to interpret and critique technology by attending to its situation and by bringing it into contact with a norm derived from the Christian *kerygma.* This norm encourages one to approach technological practices, by bearing in mind a sense of appropriateness that is distinct from technological rationality or the autonomous reasoning of a technological society. In this

[28] Andrew Feenberg, *Transforming Technology: A Critical Theory Revisited* (Oxford: Oxford University Press, 2002), 33.

view, pursuing an ethics of technological practice is a task of self-reflection which reads into technology what we see to be consistent with the strong-values of culture.

To know what technology is, is to know its material, philosophical, and cultural history. It is to be aware that technologies are ever changing in their form and application, and to respond to these changes with an ever refigured analysis. Furthermore, a hermeneutic philosophy of technology, as opposed to an essentialist philosophy of technology, does not make technology to be something which is apart from or foreign to human nature and culture. Technology arises from culture, is a part of culture, and like all cultural forms is subject to revision, reinterpretation, and control. The hermeneutic approach concerns itself with determining what constitutes the appropriateness of technology by analysing the place of technology with respect to its place within the lifeworld. Thus, to determine if a technology is 'good', it must first be asked if this technology is performing the task to which it was designed and if this task is appropriate to the need as meted-out within the context of personal and social concern.

The hope of this chapter was to provide a philosophical foundation for the present encounter with technology, and to provide an alternative to the philosophy of technological essentialism. Perhaps the most insidious difficulty one faces with a philosophy of technological essentialism is that it implies technology is somehow beyond redemption, and that the only escape from technology is through the avoidance, rather than the transformation, of technology. Moreover, technological essentialism regards all of the benefits of technology as being derived from human skills and culture, denying that these benefits may find some source in the divine. By pursuing a hermeneutics of technology, we deny that technology has an essence, and insist that it can be and must be controlled. Furthermore, the ends to which technologies are designed and employed must be made to conform to the laws of nature and the needs of humanity. We must acknowledge that technology, like all creation, finds its foundation in the Divine, but only insofar as it is given form through human hands. As an entity with ambiguous application, it suffers from the effects of fallenness, and though it can be used for positive ends, can also be used for ends which are purely self-seeking or destructive. The redemption of technology is found in the human commitment to use technologies in the service of ends which are most clearly identified with a theonomous culture

as it is oriented towards the unconditional ground of Being, or what in the Christian tradition one would call the Kingdom of God. The hermeneutics advocated here hope to illustrate that nothing, not even human technology, stands outside of the power of God to redeem. Human creativity can serve divine ends, but only if we choose to align the products of creativity accordingly.

Chapter 4: Cybernetics & IT: A History of thought and actions

In the previous chapter it was argued that in order for a hermeneutics of technology to arrive at the meaning of a given technology, it must approach technology's ambiguity, become aware of the place of the technology-user within a technological system, and be willing to critique technological practices against a norm. Additionally, as with any hermeneutic analysis, it must also become aware of the historical and material situation of its subject. To this end, this chapter will establish the material and historical context of IT, noting specifically the real-world uses and developments of information technology. Information technologies operate within the everyday-life-practices of work, recreation and education, yet they also occupy a central role in theoretical enterprises such as cognitive-science and Artificial Intelligence research, within the theoretical systems of posthuman discourse and to an extent, postmodern philosophy. This twofold tension between real and idealised technologies will be the subject matter of this chapter and the one to follow. Here, a realistic analysis of IT will be provided, which concludes with an ethics of technology argued from the stance of cyberneticist Norbert Wiener. In the chapter to come, it will be noted how the realism of Wiener, et al. has historically been eschewed in favour of the blurred realism in the analyses of IT offered in contemporary philosophy and theology.

Information theory and media

In the previous century, information technologies emerged as the most significant technological innovation in Western economic, political and social life. Computers and other artefacts of information technology have in the last 60 years taken on a nearly ubiquitous presence in the world, controlling everything from the fuel-air ratio in modern automobiles to the regulation of the global economy. Simply put, information technologies are those technologies that are required for information processing, which is to say, the computing, transforming, and representation of information. In early telephony, information processing defined the manner in which a communication at point-*A* was transmitted to point-*B*. The study of this concerned information theory, a discipline which sought to determine the factors involved in the telephonic transfer of information through the entropic attenuation of the mediating system. Communication

entropy is easily illustrated by the children's game, 'Chinese whispers' where a message originates with a child at one end of a long line of children, is whispered in the ear of her neighbour, and passed down the line mouth-to-ear. When the message finally reaches the terminus, the received message is relayed to the group and contrasted with the initial message. This simple game, which often ends in hilarity, illustrates the core concern of information theory which seeks to account for random degrees of variation in the transmission of information.

Modern information theory, as related to both statistical mathematics and electrical communication science, began with the work of Bell Labs' engineer Claude E. Shannon, whose 1948 paper, "The Mathematical Theory of Communication," 'became the catalyst for the development of "digital logical circuitry."'[1] According to Shannon:

> The fundamental problem of communication is that of reproducing at one point either exactly or approximately a message selected at another point. Frequently the messages have *meaning*; that is they refer to or are correlated according to some system with certain physical or conceptual entities. These semantic aspects of communication are irrelevant to the engineering problem. The significant aspect is that the actual message is one *selected from a set* of possible messages. The system must be designed to operate for each possible selection, not just the one which will actually be chosen since this is unknown at the time of design.[2]

In Shannon's case, the transfer of information was not about the underlying 'meaning' of the information, but simply about delivery. Much as how the Royal Mail is not concerned with the content of a parcel but rather the delivery of the parcel, information theory was principally engaged in studying features of delivery and reception in the distribution of information, rather than issues of content. Yet as the often quoted Marshall McLuhan quip indicates, the 'medium is the message', or at least the medium mediates, translates, and transforms the message. The problem of deriving meaning may ultimately lie in the hands of the information consumer, but this does not rid the process of transmission from owning up to its role as a secondary interpreter of the message.

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[1] Michael E. Hobart and Zachary S. Schiffman, *Information Ages: Literacy, Numeracy and the Computer Revolution* (Baltimore: The John Hopkins University Press, 1998), 210.

[2] Claude Shannon, "Communication Theory of Secrecy Systems," *Bell System Technical Journal*, 28, no. 4 (1949), 656.

The pure flow of information is challenged by intentional and unintentional additions and subtractions to the content of the message. This redaction by transmission adds a sense of secondary authorship from the standpoint of the message-originator, and a sense of secondary-interpretation from the standpoint of the message-consumer.

Information is always wedded to some form of material embodiment, whether written on clay tablets or typed on a keyboard and translated into bits and bytes that are persisted as 1's and 0's on the magnetic surface of a computer's hard drive. The embedding of information 'gives stability to the mental objects abstracted from the flow of experience, such that one can access them readily and repeatedly'.[3] Yet as information theorists indicate, the transmission of language and experience to a materially embedded and 'technologised' form of embodiment is not a purely inert event. Technologies, when applied to the task of communicating information, have always resulted in what is at best an ambiguous effect. Although numeric and alphabetic literacy precede the Classical era Plato's *Phaedrus* concludes with one of the earliest reflections on the possible limitations of a highly literate society. Plato laments a growing dependency upon writing, as an externalised form of remembering, which he believes would result in a diminished capacity for memory. Memory, for Plato, is the chief way in which knowledge of the forms is gained, meaning that the use of writing (and subsequently the task of reading) obstructs one's ability to reflect upon the forms.[4] For Plato, knowledge can best be found through pure reflection and dialogue, a means of dynamic engagement not allowed for by the deaf and dumb words on a written page.[5]

Plato's reflections on the written word are echoed in sentiment by contemporary cultural commentators who are quick to point out the dangers that may potentially be found in new technologies of information. Marshall McLuhan's *The Gutenberg Galaxy* argued that the invention of the printing press led not only to the democratisation of learning but also to the fragmentation of

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[3] Michael E. Hobart and Zachary S. Schiffman, *Information Ages: Literacy, Numeracy and the Computer Revolution* (Baltimore: The John Hopkins University Press, 1998), 30.

[4] *Ibid.*, 73.

[5] Plato, *Phaedros*, trans. Alexander Nehamas and Paul Woodcruf, Clarendon Plato Series (Indianapolis: Hackett, 1995), 80.

society by facilitating the social fall-out from the industrial revolution. McLuhan's critique extended to contemporary forms of media technologies as well. He is alleged to have once called electronic media, 'an unholy impostor...a blatant manifestation of the Anti-Christ.'[6] Though McLuhan never lived to comment on contemporary information technologies such as the ubiquitous computer or the internet, the later works of Theodore Roszak and Neal Postman echo what one could imagine to be a McLuhanian sentiment regarding the potential dangers which surround the cultural appropriation of contemporary IT.

Though Roszak is known most famously for his critique of technology in the context of the cultural revolution of the 1960s,[7] his later work engages the impact of computer technology upon information and education. In his *Cult of Information,* Roszak's anti-technology polemic blames information technology for the devaluation of information in contemporary society. Echoing Plato's *Phaedrus,* he is particularly concerned with IT's impact upon memory. He argues that when information ceases to be rooted in lived-experiences and becomes instead a disembodied a packet of data to be processed by a computer and passively received by a consumer, self-knowledge and education suffer. He supports this thesis by examining the pedagogical implications of the habituation to technology in school-aged children and by exploring the broader cultural phenomenon of technological reasoning. Information, by taking on what he sees to be an immaterial instantiation within computer technology, has lost its intrinsic value: 'Now, gibberish is information in the same sense as is this writing, or the sentence, "Jesus saves."'[8] Roszak's critique centres on both the technocratic society which promotes the computer as the premiere means of understanding thought, memory and information,[9] as well as the very use of information technology itself:

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[6] Gary Wolf, "The Wisdom of Saint Marshall, Holy Fool," *Wired*, 4, no. 1 (1996), 125. Journal Online. Available from http://www.wired.com/wired/archive/4.01/saint.marshal_pr.html.

[7] See: Theodore Roszak, *The Making of a Counter Culture : Reflections on the Technocratic Society and Its Youthful Opposition* (London: University of California Press, 1995).

[8] Theodore Roszak, *The Cult of Information: the Folklore of Computers and the True Art of Thinking* (Cambridge: Lutherworth Press, 1986), 12-13.

[9] *Ibid.*, 213-5.

> On the computer, one can create a self-contained fantasy world of exact logic, predictable parameters, selected data points. At some point, where one's talent to work the machine has developed sufficiently, that would lap over into one of the computer's most impressive technical capacities: simulation...The model – a neat, predictable private universe – may begin to look like a better "reality".' [10]

Alongside Roszak, Neal Postman has also offered a harsh criticism of the capacities of information technology (and other forms of new media[11]) as it relates to the devaluation of knowledge derived from first-person experience. Very much in line with Roszak's *Cult of Information,* Postman's *Technopoly* addresses what he sees as the dangers inherent in the use of computers in education, especially with respect to the habituation to information technology by the young. The computer, Postman notes, not only changes our perceptions of information, but also fundamentally alters our understanding of the cosmos and world. This artefact has become a central model for self-understanding, pushing out other models (especially religion) and draining the category of 'myth' of any potency. [12]

What Roszak and Postman neglect in their critiques of contemporary information technology is that information, in whatever instantiation it takes, is always culturally embedded and materially embodied. Information technology is neither the creation of a new virtual-metaphysical dimension nor the disembodiment of information.[13] Rather, it is the transduction of information from one substrate to another, the re-embodiment of information in bits and bytes. When seen as a materially embodied object, rather than an ethereal pseudo-object, information and the technologies thereof can be realistically appraised and their actual cultural implications discussed. Otherwise, we are left pondering reified ideas about technology's pseudo-essence and thereby alienated from production and culture.

Though information theory may not acknowledge that the transmission of information has any baring on the issue of meaning (regardless of whether this information is written on clay tablets or

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[10] *Ibid.,* 68.

[11] Neil Postman, *Amusing Ourselves to Death* (London: Methuen London, 1987).

[12] Neil Postman, *Technopoly* (New York: Vintage Books, 1993), 178.

[13] See the discussion of Graham Ward's *Cities of God* in chapter five.

sent in an email), when it comes to information exchange in the context of human dialogue, it would appear that technology's general inertness and neutrality ceases to be the rule. As McLuhan, Roszak, and Postman indicate, the technology that is used to transmit information fundamentally alters the nature of the dialogic event in which the information is at play. This meditative effect of the technologies of information radically challenges communication. If sociality is a central facet of philosophical anthropology, e.g., a reflection of self-transcendence and openness to the world, as it appears to be in the theological anthropologies of Pannenberg[14] and Tillich[15] and the philosophical anthropologies of Gadamer, Buber,[16] Scheler[17] and Ricoeur,[18] it would follow that the effect of technology on sociality can not be assumed as a transparent or non-mediating factor. Thus, the increasing ubiquity of information technologies poses a challenge not only to subjectivity but also to our understanding of human community.

It is clear then that it is not the essence of technology nor the essence of information technology which is at play within the sociological affect of this new technology, but the physical process of information transfer and attenuation which occurs within a technologically mediated

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[14] Exocentricity, or the capacity for alterity, is perhaps the most central aspect to Pannenberg's anthropological project. See:. Wolfhart Pannenberg, *Anthropology in Theological Perspective.* (Philadelphia, Pennsylvania: The Westminster Press, 1985), 61ff; *What is Man? Contemporary Anthropology in Theological Perspective.* (Philadelphia: Fortress, 1970), 71; *Systematic Theology.* (Edinburgh: T&T Clark, 1994), 197.

[15] Though his emphasis upon this topic is far less defined than Pannenberg's, Tillich still views the ability for man to both contribute to and receive from the world to be constitutive of the Doctrine of Man. See: Paul Tillich, *Systematic Theology*, (Digswell Place, Welwyn, Herts, England: James Nisbet & Co. Ltd., 1964), 1.188, 3:41. Even in, *The Courage to Be*, though not an anthropological text as such, the theme of 'openness to the world' is covered vis-à-vis man's ability to exhibit courage in the face of existence.

[16] For Buber and Gadamer, alterity (openness to the world and self-transcendence) are constitutive elements to the binary of sociality or the I-Thou relation. Martin Buber, *I and Thou*, trans. Ronald Gregor Smith, Second ed. (New York: Charles Scribner's Sons, 1958).

[17] It can be argued that the 20th century interest in openness to the world and self-transcendence finds considerable initial support in Scheler and Plessner's philosophical anthropologies. See: Max Scheler, *Man's Place in Nature.* (Boston: Beacon Pres, 1961).

[18] Paul Ricoeur, *Oneself As Another*, trans. Kathleen Blamey (Chicago: University of Chicago Press, 1992); "Narrative Identity," *Philosophy Today*, Spring (1991), 73-81.

communication event. Therefore, our focus is on the actions and materials of technology, not some undeterminable essence of technology. Appealing to the hermeneutics of technology noted above in chapter three, we see that the meaning of information technology begins to emerge as we examine its impact upon the creation of the subject and her cultural world.[19] Yet before we approach the broader impact of information technology, in order to uncover its historical and material setting we must look at a brief history of modern computing.

A brief history of modern computing

Shannon's information theory referred to problems related to the transfer of information through telephony, hinting at more expansive issues in the use of technology to mediate communication in society at large. Alongside this aspect of information theory similar principles were already being applied to the processing of information in the context of digital computing. Computers are simple machines which perform complex operations in efficient ways. They are basic information processing devices, which receive inputs, perform pre-defined operations upon these inputs, and register predictable outputs.

Without going into excessive detail, the history of modern computing can be traced back to simple mechanical adding machines which have existed in one form or the other since the 17th century. Blaise Pascal is often credited with creating the first adding machine, a simple device which used gears and teeth to add sums together. Leibniz's followed Pascal's design and added to this function the ability to perform multiplication. Similar work continued into the 19th century, with the mechanical calculator of Thomas Colmar. The difference between these information processing machines and earlier information processing devices is not so much a question of function as it is a question of technology. Abacus technology, for example, has been in existence at least since the 6th century BCE, with the earliest existing abacus-like device being the Salamis tablet used by the Babylonians around 300 BCE. All abaci and counting boards are mechanical aids for counting and not calculators in the sense of either the Leibniz counting machine or computing technology today. Whereas these later devices actually perform the mathematic

[19] This is precisely the issue that will be explored in section two, with regards to posthuman discourse.

calculation, based upon inputs received, and display the resulting outputs, abaci and the like facilitate calculations which must be completed by human computation.[20]

The practical difference between mechanical mathematics machines and the earliest computers is admittedly very slight: both compute sums of numbers, yet the latter does so with far greater efficiency and accuracy than the former. Electronic computing developed out of a need to compute data at a rate which became unfeasible in mechanistic systems. What separates electronic computation from mechanistic computation is the place of 'automation' in the function of the electronic computers contrasted with the manual operation of the mechanical computers.[21] Mechanical computers required constant human interaction for every stage in data processing. Humans were required to spin dials, pull levers, set stops, and create a log of tabulations. The job of the manual computer was merely to aid the human computer (the actual flesh-and-blood person whose job it was to interpret the data and 'compute' the information) in the most mundane facets of his or her work.

Hardware

The goal of computer science/technology research in the 1930's and 40's was to create a device which was relatively free of human input and could, as a result, perform far more complex operations with greater efficiency. The first such machine was the Atanasoff-Berry Computer (ABC) designed from 1937-1942 at Iowa State University. Atanasoff's digital computer incorporated 3KB of rotary-drum regenerative memory, parallel processing, and the separation of computation and storage in the computer's memory.[22] His work anticipated the more commercially successful projects of Eckert and Mauchly, whose ENIAC and UNIVAC systems are also often

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[20] For a further exploration of the historical antecedents to modern computing, see: Georges Ifrah, *The Universal History of Computing : From the Abacus to the Quantum Computer* (New York: Wiley, 2000).

[21] Interestingly, the term "automation" was coined at the Ford Motor Company in 1947 and popularised by John Diebold in a 1952 book by that title. Diebold defined the word as the application of "feedback" mechanisms to business and industrial practice, with the computer as the principal tool.' Paul E. Ceruzzi, *A History of Modern Computing*, Second ed. (London: The MIT Press, 2003), 32.

[22] Paul E. Ceruzzi, *A History of Modern Computing* (London: The MIT Press, 2003), 38.

credited as the first digital computers.[23] Unlike Atanasoff's adding machine, Eckert and Mauchly were able to bring the fragile and obscure technology of computational science into the commercial sphere; transforming what was merely an obscure scientific instrument into what has now become an integral part of commercial business systems. Eckert and Mauchly's first digital computer, the ENIAC (Electronic Numerical Integrator and Computer) was commissioned during World War II by the United States Army as an electronic tool used to compute projectile trajectory tables (a task which required tedious and mundane repetitions of arithmetic functions).[24]

In his biography of the ENIAC, Scott McCartney paints the following picture of the early days of computer engineering:

> One person could run the machine, and the average running time before something went wrong was between five and six hours. Preparing a program of the machine took a month or two, and setting up the machine took a day or two, often involving setting some 3,000 switches. Debugging a program could take a week. Despite its size, ENIAC was a very personal computer. You could wander around it, watch it work, snuggle up to its warmth. Operators struggled with it fragilities and swore it suffered serious mood swings.[25]

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[23] Digital computing is a term contrasted with analogue computing. In the former, information is translated into distinct numeric or symbolic values whereas in the latter, signal is processed as a function of electric resistance. Digital computers are used for finite-state systems where a value needs to be determined within a set limit range, whereas in analogue computing results are non-linear. The non-electric analogy digital computer would be an abacus where computation is based upon a finite number of beads on rods. Analogue computers are akin to slide rules, where results, in theory, are derived from a range of computational options.

[24] By the fall of 1945, shortly following armistice, the ENIAC project was finally completed, engineers had finished the hardware and the programmers had learned how to operate it. It took over 200,000 man-hours to build at a cost of $486,000. To give the reader a sense of its size, it weighed over 30 tons, filled an 1,800 square foot room, with 17,468 vacuum tubes, 500,000 soldered joints, 70,000 resistors, and 10,000 capacitors (incidentally, this is as much circuitry as could fit on the head of a pin using contemporary microprocessor technology). The machine consumed 174 kilowatts of power to at a cost of $650 per hour, even when not operating. It could perform 5,000 additions cycles a second, doing the work of about 50,000 people doing work by hand. Scott McCartney, *Eniac* (New York: Berkeley Book, 1999), 101-2.

[25] Scott McCartney, *Eniac* (New York: Berkeley Book, 1999), 94.

The ENIAC was followed by the UNIVAC (Universal Automatic Computer), the first commercially successful digital computer. Unlike earlier punch-card machines which stored and executed their basic functions on paper cards, requiring constant interference from their operators, both the ENIAC and the UNICAC ran their programmes in stored memory, reflecting the implementation of what is now known as von Neumann Architecture. John von Neumann (1903-1957), an early and highly influential computer scientist, asserted that there were four basic functional units involved in successful digital computing:

> memory, processor, input and output. Below that level were the functional building blocks, which carried out the logical operations....below that were circuits that each required a few...components that electrical engineers were familiar with...[26]

The formal introduction of separate functional-memory and stored-memory facilitated the automation sought after by researchers in digital computing, as the computer itself became the entity responsible for assigning meaning to mathematic formulae.[27] The implementation of von Neumann architecture signalled the inclusion of computer science within the broader discipline of information technologies, as von Neumann devices were nothing short of information processing systems which moved data from one point in the computer's architecture to another. Information was inputted into the information processor, routed into either the storage or processing memory of the computer and, after having undergone *n* degrees of transformation, outputted to the user as readable and interpretable information.

Technically speaking, using magnetic memory tapes rather than punch cards meant that for the first time software and hardware were combined in pursuit of computational functionality. Even still, at this early stage 'programming' and 'setting-up' the computer involved more mechanical configurations of the machine's 'maze of cables' and 'arrays of switches' than what in today's parlance reflects programming via a typing terminal.[28] Unlike today, from the 1930's until the

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[26] Ceruzzi, *A History of Modern Computing*, 179.

[27] John von Neumann, "First Draft of a Report on the Edvac," (University of Pennsylvania, Moore School of Electrical Engineering, 1945).

[28] Ceruzzi, *A History of Modern Computing*, 21.

1970's computer hardware was by far the most economically valuable and creatively innovative aspect of the hardware/software confluence. Physically, computers were large, expensive, complicated, and hard to maintain industrial/commercial devices which required masses of highly skilled labour to design, operate and maintain. Software functions were rudimentary and only secondary to the processes of the device as a whole. However, as computer hardware became increasingly mass produced, the programmes themselves became increasingly more valuable and integral to the system as a whole. Economically, this reflects a bazaar reversal of valuations, as the material technology became devalued whilst the intellectual technologies were elevated to the point of commodity.[29]

Software

Software, or programming, is a set of instructions which directs a computer to perform a specific task. In today's personal computers, the computer's programming is a highly complex multi-tiered system, wherein various levels of coding are employed to control different elements of the computer's system. The software hierarchy is often described as analogous to a multi-layered cake. The base of the cake is the hardware layer where programming is performed through the physical impedance of electrical current by way of capacitors and switches. Here, development is not written with a keyboard and a mouse, but with tweezers and soldering irons. Above the hardware layer is the machine language layer where digital binary information is physically passed through the hardware layer in the form of electrical current. This language is represented in binary, which is to say, in sets of ones and zeros which instruct the hardware to turn on and off various elements. Although machine language is the native language of the hardware itself, for the human programmer it is a difficult and tedious language to learn and use. To programme in machine level language, extensive binary codes and octets would need to be memorised by the developer, making machine language prohibitively complex for the creation of anything but the most rudimentary

[29] The current trend in the economics of computing is the move to open source software, where software is regarded as a creative produce of a group of individuals which is intrinsically beyond financial valuation. See: Thomas Goetz, "Open Source Everywhere," *Wired* 11, no. 11 (2003). Journal Online. Available from http://www.wired.com/wired/archive/11.11/opensource_pr.html.

tasks. As a means of lessoning the development burden, assembly languages (the layer above machine language) were developed as abbreviated English-like substitutions for unwieldy strings of binary digits. Assembly language consists of a basic syntax which translates small alphanumeric commands into their binary equivalent that are then executed at the machine level and finally upon the hardware itself. Assembly languages are hardware-dependent, which means that they are written to correspond to the particular machine language of the hardware that they are executed upon. To execute assembly language, code must be first translated into machine language by a computer programme called an assembler, a small application that converts assembly code into the machine code required by a particular hardware environment.

From the perspective of the computer's hardware, the abstraction of a computer language increases as the language becomes more English-like. From the perspective of the computer user (or software developer) the more English-like the language, the more meaningful it becomes. The more English-like languages are referred to as 'High Level Languages', as their syntax incorporates a higher level of abstraction which enables the development of more complicated tasks. As with any other language which is written above the machine language level, in order for programmes that are written in High Level Languages to be run, they must be translated into lower level languages which run on the lower levels of the computer's system. At the very top of the programming-cake, the highest levels of abstraction are graphically represented object-oriented programming languages. These allow the computer user to develop applications of varying complexity without even needing to know the 'language' in which he or she develops. Besides changing the task of computer programming, object-oriented programming (OOP) has revolutionised the methodology behind software development.

In the past, computer programming has been more about the logical procedure behind the process of the application, rather than the specific task of the application itself. The computer programmer was primarily one who wrote logical software and not software which was considerate of the data produced. Think back to the earliest word-processing applications, and contrast the relative ease with which one writes a document on a computer today with the complexity of using a word processor in the mid-1980's. Rather than requiring the software-user to read a lengthy

technical manual, to memorise complex key-stroke combinations, and to have a high-degree of technical savvy in order to write a document on the screen, modern day computers with graphical user interfaces and robust operating systems are designed to be as 'user-friendly' as possible. The more user-friendly an application (or an application language) becomes, the more akin to 'normal' (that is to say, non-technical) language and functionality the computer system becomes as well. The goal of modern-day computing is to create a technology which despite its apparent complexity is so seamlessly integrated into modern life that one can easily forget that it is there.

Ubiquitous Computing

The trend in contemporary computer design is to move away from the image of the computer as a box on a desk to the notion of ubiquitous computing or what Paul Dourish describes as embodied, tangible, and social computing. Through a variety of small and specialised devices, information technology can be seamlessly integrated into the broader lifeworld. Dourish argues that the previous paradigm for software and hardware design uncritically reflects a Cartesian separation of mind and matter, thought and action. To reconcile such separations, he puts forward an embodied and social paradigm for computer design, where computer hardware and software is developed to meet the needs of the individual user's specific context, rather than forcing users to adapt to the requirements of a generally designed technology. Looking at how computers function in the world, he argues, means studying 'human-computer interaction.'[30]

For Dourish, the key to understanding computers is to pursue an understanding of the world in which they operate. His thesis posits that an embodied analysis of computer actions must move towards the embedded nature of computing in the lifeworld.

> Interaction with screen and keyboard, for instance, tends to demand our direct attention; we have to look at the screen to see what we're doing, which involves looking away from whatever other elements are in our environment, including other people. Interactions with the keyboard requires both of our hands. The computer sits by the desk and ties us to the desk, too. So, it is not simply the form of the computer that has changed

[30] Paul Dourish, *Where the Action Is : The Foundations of Embodied Interaction* (London: MIT Press, 2001), 2.

> remarkably little over the last thirty years; it is also the forms of computer-based activity and the roles what we imagine computers-playing in our everyday lives.[31]

In light of this Dourish calls for cultural sensitivity and contextual awareness in the design of embedded and tangible computer systems.

> The essence of tangible computing lies in the way in which it allows computation to be manifest for us in the everyday world; a world that is available to our interpretation, and one which is meaningful for us in the ways in which we can 8understand and act in it.[32]

Tangible computing stresses that computer-use occurs within a broader cultural context and resists the idea that computation occurs at a single fixed spot (the box on the desk) or within some ethereal and fictive sphere (virtual reality). It resists the notion that information technology is more than a tool and can thus curtail the mistaken view that technology is the nexus of a 'virtual reality' or some new metaphysical sphere.[33] Dourish rightly understands information technology to offer alternative sets of practices rather than alternative foundations or essences. 'Embodied interaction is not a technology or a set of rules. It is a perspective on the relationship between people and systems.'[34]

Cybernetics: the confluence of information technology and information theory

The interaction between 'people and systems' or users and computers that is called for by Dourish's theory of computer design, signals a return to the concerns of early cybernetic theory. Though cybernetics and information technology are often treated synonymously, they do reflect distinct fields of research. Cybernetics stems from a humanities-minded study of information theory. It focuses on the study of both natural and manmade systems, which exhibit forms of information flow. Unlike AI or IT in general, which often privilege the computational model of the world (models of consciousness, 'virtual reality', social-systems) over and against the modelled

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[31] *Ibid.*, 27.

[32] *Ibid.*, 53.

[33] This is a problem we shall encounter in chapter five, with respect to Graham Ward's treatment of virtual reality and in section two, regarding the place of the computer in the posthuman ethos.

[34] *Ibid.*, 192.

real-world, cybernetics approaches the 'real-world' hand-in-hand with the social sciences and the humanities in order to learn collaboratively rather than prescriptively.

Cybernetics is the science of command and control. It attempts to explain how regulated systems which are observed by the in the natural, social and technical sciences issue and receive communications that contribute to the maintenance of the whole.[35] The application of a cybernetic analysis explores how principles of command and control (or regulation and communication) apply to 'systems', irrespective of whether these systems are living, social, or artificial. Cybernetics can be broken down into two main schools: the first deals with issues pertaining to technical automation and the second deals with issues pertaining to the analysis of organic and social systems. The former school explores the nature of causality, with respect to technological developments of computers and automata and discusses these in terms of computation and regulation in the control of artificial systems. The latter school applies cybernetic theories to the analysis of human and social sciences, and through the language of command and control seeks to arrive at an epistemology which explores issues pertaining to autonomy, identity, and teleology. Cybernetics is, in this sense, a universal science that crosses-over conventional disciplinary boundaries.[36]

Early work in cybernetics theory occurred alongside early developments in information technology and facilitated an important shift in how humanity was to be perceived alongside

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[35] The term cybernetics, in reference to the field of control and communication, dates back to 1947. It is derived from the Greek term, *kubernetes* – 'steersman'. A steersman controls his ship by adjusting the rudder to the forces of river that are communicated through the tiller. Wiener later realised, despite his earlier claims to the contrary, that he was not the first person in contemporary thought to employ the term cybernetics, though Ampère used the term in relationship to the forces of political science, and not to command-control systems at large. Contrast Norbert Wiener, *The Human Use of Human Beings* (New York: Houghton Mifflin, Co., 1954), 15 and Norbert Wiener, *Cybernetics: Or Control and Communication in the Animal and the Machine* (New York: The Technology Press, 1948), 19.

[36] Although cybernetics had seemingly straightforward beginnings, it was Wiener's intent and interest, even as early as 1948, to examine how systems of feedback and control could inform one's understanding of social anthropology as well as one's understanding of human physiology. Wiener, *Cybernetics,* 21; 35ff

technology. By providing a metaphor for causality and teleology which was equally valid for both biological and artificial systems, cybernetics made possible a discussion of functional equivalences between human and machine action. For cybernetics, the question, 'What does this thing do?' is always asked prior to the question, 'What is this thing?' This paradigm set in motion later equivalences between human and machine consciousness made by artificial intelligence researchers in the 1960s which likely led to the predominance of computer-metaphors for consciousness and education in the 1980s.[37]

Early beginnings of cybernetics

The modern science of cybernetics finds its early beginnings in a 1943 paper entitled, 'Behavior, Purpose and Teleology', by Norbert Wiener, Arturo Rosenblueth and Julian Bigelow. Their essay sought to describe, through a behaviouristic methodology, a universal model of agency which read behaviour as an economy of an agent's 'inputs' in relationship to an agent's 'outputs'. Despite the technical use of 'input' and 'output' in contemporary computer science, in Wiener, et al. the terms were employed to describe the degree to which any entity's purposes and goals (biological, psychological, or mechanistic) could be determined by an examination of its actions. Thus, the external behaviour of an entity (the outputs), when analysed alongside the events which modify the agent's behaviour (the inputs), leads to the interpretation of any action as that which is 'directed to the attainment of a goal.'[38] Purposefulness, according to this definition, can be understood in terms of self-regulation, that is to say, an agent's ability to regulate its own actions in relationship to changes in its environment. This exchange between actions (outputs) and regulations (inputs) is referred to by Wiener et al. as 'feed-back'; what is understood as being

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[37] Though admittedly, these analogies have existed from the very beginnings of computer research. Von Neumann, the father of modern computer architecture, published such analogies from the perspective of an amateur neuroscientists in 1958. He argues that the human brain, like the computer, is a parallel processing device. See: John Von Neumann, *The Computer and the Brain* (New Haven: Yale University Press, 2000).

[38] Arturo Rosenblueth, Norbert Wiener and Julian Bigelow, "Behavior, Purpose, and Teleology," *Philosophy of Science*, 10, no. 1 (1943), 18.

indicative of teleological purposiveness.[39] Here, teleology is defined as 'purpose controlled feed-back'[40] and not as final-causality nor as that which is antithetical to determinism. Purposive ends are ends that are related directly to the agent's present environmental situation. Unlike causality which 'implies a one-way, relatively irreversible functional relationship', teleology (in Wiener et al.'s repurposed definition) is concerned purely with behaviour irrespective of functional relationships.[41]

In light of this functional similarity, Wiener believed that it was through strict behaviourism that the agency of machines and living organisms can be understood as equivalents of each other.

> It has sometimes been stated that the designers of machines merely attempt to duplicate the performances of living organisms. This statement is uncritical. That the gross behaviour of some machines should be similar to the reactions of organisms is not surprising. Animal behaviour includes many varieties of all the possible modes of behaviour [purposeful, teleological, predictive, etc.] and the machines devised so far have far from exhausted all those possible modes. There is, therefore, a considerable overlap of the two realms of behaviour.[42]

This appeal to agency collapses the hierarchical divisions between living organisms and machines. With respect to purpose and teleology; the ability to function within a feedback system becomes the hallmark of autopoiesis.[43] Famously, Wiener applied his cybernetic analysis to the very subsystems present within human physiology. The human cybernetic system *par excellence* was seen by Wiener to be the nervous system, which receives input from nerves and limbs throughout the body, adjusting the body's activity and relative position in space accordingly. The attempt to

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[39] *Ibid.*, 19.

[40] *Ibid.*, 23.

[41] *Ibid.*, 24.

[42] *Ibid.*, 22.

[43] The origins for their decision to equivocate human and machine teleology are explored in detail in Wiener's *Cybernetics: or control and communication in the animal and the machine.* In the context of the Second World War, Wiener and his team of engineers were tasked with researching a 'mechanico-electrical system which was designed to usurp a specifically human function...the execution of a complicated pattern of computation; and...the forecasting of the future.' Norbert Wiener, *Cybernetics,* 13.

uncover the universal nature of feedback loops inspired Wiener to imagine the unbounded possibilities of human-machine cybernetic augmentation. The many benefits of cybernetics foreseen by Wiener in terms of greater degrees of self-understanding, and the patently humane use of the technology in alleviating the inadequacies of extant prosthetic limbs, are tempered by his nearly apocalyptic concern over the uncritical proliferation of self-regulating automata in manufacture and industry. Yet, although artificial limbs weigh in on the positive side of the unbounded potential of cybernetic technology, later in Wiener's career he became increasingly aware that the unbounded nature of cybernetics was inclusive of diabolical as well as creative potential.

Conclusion: Towards a cybernetic ethic

At the beginning of this chapter, it was noted that in order to understand the social implications of information technology, technology must be approached realistically and hermeneutically, thereby eschewing the errors of cybernetic totalism and technological essentialism. To this end, the majority of this chapter has explored a IT's historical and material context, as a contrast to the discussion of idealised technologies in the following chapter. It is useful at this point, as we come to the conclusion of this chapter, to make note of what are some of the broader cultural and societal implications of information technology as voiced by Wiener's early cybernetic theory and echoed in his later ethical judgments on the subject. In Wiener we will see a concern for the social implications of IT that is firmly rooted in actual, rather than idealised technologies.

As one of the earliest fathers of modern cybernetics, it is significant to note that Wiener was also one of its earliest and most ardent critics. His critique of this science was two-fold, centring on both the concrete socio-economic implications of cybernetic automata and the more diffuse religious and ethical implications of cybernetics. Wiener cites the future of mechanised labour in the context of manufacture and production, and laments the potential absence of the human-worker in an economy fuelled by cheap 'mechanical slave labour'.[44] It is clear that Wiener is not only

[44] Wiener, *Cybernetics,* 37. Though it is true that cybernetic theory allows for the creation of 'a new and most effective collection of mechanical slaves to perform...labor,' such automata would still result in the

concerned with cybernetic technologies or theories themselves, but with the social and economic forces which would employ his theories apart from his own humanistic leanings. Cybernetics, which was initially envisioned as a means of bringing about positive forms of human-machine interaction, holds within its science the potential to dissolve the human machine relationship in favour of pure efficiency. Wiener writes the following warning:

> Those of us who have contributed to the new science of cybernetics thus stand in a moral position which is, to say the least, not very comfortable. We have contributed to the initiation of a new science which, as I have said, embraces technical developments with great possibilities for good and for evil. We can only hand it over into the world that exist about us, and this is the world of Belsen and Hiroshima. We do not even have the choice of suppressing these new technical developments. They belong to the age, and the most any of us can do by suppression is to put the development of the subject into the hands of the most irresponsible and most venal of our engineers. The best we can do is to see that a large public understands the trend and the bearing of the present work, and to confine our personal efforts to those fields, such as physiology and psychology, most remote from war and exploitation. As we have seen, there are those who hope that the God of a better understanding of man and society which is offered by this new field of work may anticipate and outweigh the incidental contribution we are making to the concentration of power....I am compelled to say that it is a very slight hope.[45]

For Wiener, the technical definitions of what constituted self-learning and self-ordering systems and the positive rhetoric which accompanied discussions of human-machine systems, posed an important challenge to the traditional Judeo-Christian interpretations of the human as a being made uniquely in the image of God. As noted in the Introduction to this thesis, in his later work, Wiener became preoccupied with questions of the divine provenience of cybernetic organisms, with respect to the possibility of divine limitations over human technologies. He asks after the extent to which the created image includes human creations, and asks, If God is ultimately the origin of all feedback systems, do such systems fall under God's control? In *God and Golem, Inc.* Wiener explored these questions and couches their answer in an ethics of

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same socio-economic implications as would any other unpaid-labour force. Cheap goods produced by unpaid labourers would still result in the devaluation of similar goods by skilled craftsmen.

[45] *Ibid.,* 38-9.

technological practice that was rooted in the concept of 'care.' This includes caring for cybernetic systems as partakers in the divine gift of autopoiesis, and care also for humans who are impacted by such systems. For Wiener, God is the ultimate self-regulating system whose being is imitated in the functioning of all other self-regulating systems (artificial, social and organic). To share in the image of God is to share in a functional or operational similarity with the divine, rather than any form of pictorial or ontological likeness. As all such systems participate in the divine image, all such systems are at some level, deserving of care.

> Man makes man in his own image. This seems to be the echo or the prototype of the act of creation, by which God is supposed to have made man in His image. Can something similar occur in the less complicated (and perhaps more understandable) case of nonliving systems that we call machines?[46]

For Wiener the answer to this question is undoubtedly 'yes' – machines are both able to learn and able to reproduce. They exhibit the potential for artificial life, what can be described in both organic and mechanistic entities as *autopoiesis* – self-constituting and self-maintaining capabilities. Fear of these systems arises from what he terms a 'reprobation attaching in former ages to the sin of sorcery', which for many is presently associated with the 'speculations of modern cybernetics.' Yet although these cybernetic sorcerers may appear to possess Frankenstein's genius and Rabbi Loeb's cabalistic knowledge, Wiener would argue that there is a fundamental hubris on the part of those who would think that cybernetics (or any science) could produce either the companionship of Frankenstein's monster or the obedient servant of Loeb's Golem:

> [T]he future offers very little hope for those who expect that our new mechanical-slaves will offer us a world in which we may rest from thinking. Help us they may, but at the cost of supreme demands upon our honesty and our intelligence. The world of the future will be an ever more demanding struggle against the limitations of our intelligence, not a comfortable hammock in which we can lie down and be waited upon by our robot slaves.[47]

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[46] Norbert Wiener, *God & Golem, Inc.: a Comment on Certain Points Where Cybernetics Impinges on Religion* (Cambridge, Mass.: The MIT Press, 1964), 29.

[47] *Ibid.*, 69.

With great foresight, Wiener approaches the crux of the issue in regards to the future nature of human-machine relationships. Just as cybernetic technologies themselves are based upon a concept of external regulation which is internal to the processes, uses and applications of technologies (cybernetic and otherwise); all technology must be predicated upon a non-technological form of regulation which impacts and governs technological and social systems. So then, the feedback loops of economic production in an unregulated capitalist economy must be regulated by humanist desires which place value on the worker over and against cheaply manufactured goods. Likewise, developments in cybernetic technologies which create entities that compete with or augment human life must be regulated by external governances which emphasise moral and spiritual formation, over and against utopian speculations. Wiener's philosophy of technology is entirely informed by a desire to preserve some core of human dignity which arises from social, rather than technological, constructs. In Francis Fukuyama's terms, this 'Factor-X' distinguishes human beings from other creatures and resists radical reductionism of the human subject to a mere collection of genetic or phenomenological traits.[48]

Wiener's appraisal of his own science reflects his religious concern that technology ought to be used in the service of a society which seeks to magnanimously regulate its developments. This, I believe, is in keeping with the hermeneutic philosophy of technology argued for in the conclusion of the previous chapter. Technologies are judged appropriate when interpreted alongside the strong-values of a given culture.[49] He writes:

> One of the lessons of the present books is that any organism is held together in this action [the anti-homeostatic factors in society] by the possession of means for the acquisition, use, retention and transmission of *information* [emphasis mine]. In society too large for the

[48] Francis Fukuyama, *Our Posthuman Future: Consequences of the Biotechnology Revolution* (London: Profile Books, 2003), 148-150.

[49] The idea of 'strong values' is taken from my reading of Charles Taylor, *Sources of the Self: the Making of the Modern Identity* (Cambridge: Cambridge University Press, 1989). Here, he uses the notion of 'strong evaluations' to connote the notion of a communally held value as the foundation of ethics. Taylor, *Sources of the Self*, 4, 14, 20, 42, 422, 332, 333, 336, 337, 383.

> direct contact of its members, these means are the press...the radio, the telephone system, the telegraph, the posts, the theatre, the movies, the schools, and the church. [50]

Applied in the service of society, rather than purely for the service of the economy, cybernetics reveals the importance of information as a factor which unifies social systems. Even though information may serve as the *élan vital* of a cybernetic system, whether computer systems, the human nervous system, or social and cultural structures, it is only through its interpretation and context that information finds its meaning. The difference between meaning and noise can only be observed within cybernetic systems in the light of the information's application. Thus, within society, cybernetics is only one of many other forms of discourse which contribute to the regulation of the societal entity. It is neither the scientists nor the economists who alone manage the flow of information; rather it is the very 'un "scientific" narrative method[s] of the professional historians'[51] which allows information to be distributed across social systems. Wiener's philosophy of regulated cybernetic developments can be best summarised in the aphorism: 'Render unto man the things which are man's and unto the computer the things which are the computers.'[52]

The drive for context within the lifeworld, either in the case of Dourish's model of computer development or Wiener's warnings against the unchecked excesses of cybernetic technologies, pushes computing back into its realistic origins as a part of the human lifeworld, serving as a tool put to the service of a specific end. In the following chapter, we will see how this realism is blurred by an encounter with cybernetic totalism. By obscuring our ability to find an ethical grounding in actual information technology, the blurred realism described in the following chapter fails in its attempt to arrive at a satisfactory understanding of the place of IT in contemporary culture. Even before technology takes on explicit mythic significance in posthuman discourse, we shall see how in much contemporary theological and philosophical descriptions of information

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[50] Wiener, *Cybernetics,* 187-8.

[51] *Ibid.,* 191.

[52] Wiener, *God & Golem, Inc,* 73.

technology, IT has become unanchored from its grounding in practice, ignoring Wiener's warnings and disregarding what are the current directions of computer research.

Chapter 5: Blurred Realism: the implications of Cybernetic Totalism

The previous chapter surveyed IT's historical and material developments, offering a realistic analysis of contemporary information technologies. The chapter concluded with an exploration of Wiener's ethics of technological practices which sought to approach technological self-limitations in light of culturally determined strong-values. Wiener's realism reflected the hermeneutic concerns that were defined in chapter three (e.g. an awareness of technology's ambiguity, concern for the place of the subject within technological practices, and the necessity of a practical critique of technology against a norm). Here in chapter five, it will be shown that the realism from which a hermeneutic of technology can proceed has been ignored in contemporary philosophical and theological discussions of information technology. The figures discussed below have allowed their analyses to become unanchored from the everyday uses of technologies, drifting away from technology's real applications. As a result, these idealised readings of technology have lost the poignancy of ethical or practical critique.

This chapter is a bridge between the realist (materialist-historical) analysis of actual information technology in the previous four chapters and the posthuman (imagined-speculative) appropriation of technology which will constitute the crux of section two. Whereas this section delineates realist and idealist interpretations of technology, the following section will engage with imagined and speculative technologies, drawing from science fiction, theory, and speculative science. Realism and imagination, it will be argued, offer a valid resource to a theology of technology by providing the ethics of technological practices which arise from a theology of technology a keen awareness of the technology-user's cultural situation. In the material-historical reading of technology, this is facilitated by a hermeneutic which seeks to judge technology by a norm based in either the *kerygma* or the strong values of culture. In the imagined scenarios of science fiction (chapter seven), this is facilitated by the self-reflexive critique of the science-fiction imagination. In contrast, idealism (the present chapter) and speculation (chapter eight) deny theology of any such practical resource. Whereas a realist or imagined reading of technology treats technologies as a means to an end or allows the subject to self-reflexively engage with technologies

as a part of culture; the idealised or speculative reading of technology invest technologies with ultimate significance, thereby obliterating the distinction between technology and culture. Technology for the idealist or the posthuman speculative scientist becomes itself the goal of human culture, denying culture any access to the ultimate.

With this in mind, this chapter will comment on three aspects of contemporary information technology and note the theological and philosophical treatment of each. By looking at how information technologies feature in 1) vocational practices, 2) cognitive science, and 3) artificial intelligence research, we will observe the progressive obfuscation of actual technologies within the theological or philosophical treatment of such technologies. By centring on idealised technologies, the philosophers and theologians dealt with below commit the fallacies of technological essentialism and cybernetic totalism, inasmuch as they fail to approach technology with a sufficient concern for how it is used and developed in everyday life.

Vocational Life and Culture

In the vocational context, computers were initially implemented as automation machines which were designed and sold for the purpose of reducing human labour, speeding up record keeping, tabulations and inventory. Theodore Roszak has commented that of occupations to receive the 'benefit' of mechanisation, 'white collar work was one of the last...to enter the machine age. Well after the mines, the factories, the farms had been mechanised, office workers were still scribbling away with pen and pencil, hand-filing their papers in cabinets and loose-leaf binders.'[1] From our contemporary standpoint, it is often hard to imagine that it was only just prior to the 1960's that many of the mundane professional tasks done today by computers were primarily performed by individual workers who would write or type information onto carbon paper and store this information in massive filing cabinets.[2]

The personal computer, as the public face of the so-called information age, has had a significant impact on the way in which those in the post-industrial world live, work and learn. As

[1] Theodore Roszak, *The Cult of Information: the Folklore of Computers and the True Art of Thinking* (Cambridge: Lutherworth Press, 1986), 7.

[2] Paul E. Ceruzzi, *A History of Modern Computing*, Second ed. (London: The MIT Press, 2003), 47.

early as 1983, the computer was being recognised within the popular consciousness as among the most significant additions to contemporary culture.[3] The issues regarding the application of IT in the workplace and in society in general have been discussed recently by theologians Ian Barbour and Graham Ward. Barbour and Ward come from different perspectives in regards to their theological and ethical evaluations of this technology. Barbour approaches technology in light of his previous work in the science-theology dialogue and evaluates technology primarily in regards to its relationship to the sciences. In contrast, Ward views technology as a consequence of culture and appears less concerned with IT's social impact, in terms of the everyday use of actual technologies, than with its theoretical and cultural implications. The difference between a scientific-realist approach to technology and a cultural-idealist approach indicates the limitations of either Barbour or Wards orientation towards IT. Namely, as has been argued throughout this thesis, one must analyse both the material context of IT and its cultural implications, in order to suffeciently evaluate the ethical or theological implications of this technology. Though Barbour offers a thorough analysis of the developments and implications of information technology, he fails to note how information technology engages the cultural imagination. Conversely, Ward centres purely on the cultural imagination and as such uncouples his analysis from any realistic impact on society at large. We shall see that in order to engage with information technology, the realist and cultural dimension of IT must be explored together.

Barbour: *Ethics in an Age of Technology*

In *Ethics in an Age of Technology,* Barbour discusses the theological and ethical implications of a variety of modern technologies, inclusive of manufacture, transportation and communication technologies. His hope is to provide an ethical framework from which one can act 'theologically' in a technological world. Having served as one of the forerunners in the 20th century's science-theology dialogue, Barbour applies much of his previously established methodological rigour to the ethical and theological issues surrounding the use and dissemination of contemporary technologies.

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[3] For reflections on the broad implications of the computer in business, personal life and entertainment, see: Otto Friedrich, "The Computer Moves in," *Time*, 1983.

In general, Barbour approaches technology in light of three methodological considerations: First, he views technology in its relationship to science, in order to determine the 'consequences of alternative technological policies and for its understanding of the interdependence of humanity and the nonhuman world.' As applied-science, technology for Barbour always provides a material framework for the theories of the sciences. Secondly, technology is approached philosophically in order to provide a means of systematic reflection for his utilitarian ethics of technology, whereby the appropriateness of a technology is determined through a cost/benefits analysis. Lastly, the value of a technology is approached in respect to the 'Christian tradition' which tempers his utilitarian notions of justice and freedom, by subsuming philosophical ethics under the 'biblical understanding of human nature, hope for the future, and the motivation for action arising from an ethics of response.'[4]

Determining a theological ethics of information technology is a difficult task which seems to push the limits of Barbour's methodological considerations. Unlike other technologies, information technology requires familiarity with both the culture that surrounds IT and the everyday use of IT. Barbour is right in arguing that IT's ambiguities reveal themselves less in terms of their environmental or economical impact, than in terms of IT's ability to promote a blind optimism in the technology's ability to overcome human need. IT pundits are more likely to fall prey to a blindly-optimistic futurism which promotes the benefits of information technology without a critical awareness of its consequences. For Barbour, IT 'futurists' assert that:

> [A]utomation will bring high productivity, material abundance, the elimination of repetitive jobs, and more time for the creative use of leisure. The information society will be more egalitarian; old class divisions will be obsolete when knowledge rather than wealth is the source of power. Organizations will be les hierarchical as decision making is decentralized among smaller units connected by computer networks. Democracy will be enhanced by instant referenda and electronic voting, made possible by multi-channel

[4] Ian Barbour, *Ethics in an Age of Technology*, The Gifford Lectures 1989-1991, vol. 2 (London: SCM, 1992), 35.

> interactive cable systems. Telecommunications will improve world-wide understanding in the "global village"'[5]

Yet, beyond this mention of the cultural implications of IT, Barbour's general analysis proceeds along exclusively material lines. Keeping with his utilitarian ethics, Barbour supplements this utopian sentiment by recalling the darker elements of IT's use within everyday life. Though not as obviously consequential as the personal and environmental impact of other technologies (i.e., heavy manufacture of agriculture), Barbour notes the medical consequences of repetitive stress disorder arising from keyboard use, the isolation faced by workers in the modern day 'cubicle' office, the 'information gap' regarding access to digital computers in the developed verses developing worlds, and the problems posed to personal privacy in light of centralised information stores.[6] Barbour's most intriguing concerns centre on the use of IT in military war-game simulations and AI, both which reflect the ability for computers to simulate and desensitise one's receptiveness to reality. According to Barbour, computers 'present few problems of environmental impact or sustainability' but, 'they raise serious questions about work and personal fulfilment, in addition to justice and participation.'[7] Barbour's ethical project seeks to determine how IT impacts the practical life of users, in the interface of real-world situations with real-world technologies.

Although his pragmatic interests are a necessary component to a holistic analysis of IT, he seldom engages with the broader theoretical and cultural implications of IT. Unlike Wiener, he does not reflect upon how IT or cybernetics impinges upon religion, the *imago Dei* or the limits of human creativity. Nor does he explore the cultural appropriation of IT in posthuman discourse, cyborg theory, or cultural studies. Though these subjects may appear 'fringe' – or at least secondary when contrasted with the real world consequences of IT use – as the second section of this thesis will argue, they reflect a particular appropriation of information technology which is no less significant.

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[5] *Ibid.*, 146.

[6] *Ibid.*, 151.

[7] *Ibid.*, 85.

Although certainly a contribution to Christian thought on information technology, Barbour's work fails to engage with the broader cultural implications surrounding IT, in favour of a rigorous analysis of the material situation of IT. In this regard, a book such as Graham Ward's *Cities of God* serves as an intriguing counterpoint. Whereas Barbour is concerned primarily with the nuts-and-bolts of technological ethics, Ward's work is concerned almost exclusively with the abstract application of information technology within culture. So much so, in fact, that Ward's argument eventually becomes ungrounded in actual technologies and ultimately fails to provide the ethical critique which he intends to offer in the first instance.[8]

Ward: *Cities of God*

Like Barbour, Ward's interest in technology extends beyond the subset of information technology. In *Cities of God* he analyses the technological nature of contemporary western society with a special interest in the technologies of community and the image of the city. When Ward specifically turns his attention to information technology, his writing has resonances with the work of his colleague Elaine Graham whose *Representation of the Post/Human* engages with the social, personal, and mythical dimensions of networked culture.[9] Like those in the Prosthetic School noted in chapter two, Ward seeks to find an ontological connection between information technology and human being and asserts that computer-mediated subjectivities such as those of the 'cyborg/clone' speak to deeply theological notions of embodied identity.[10] As will be described more fully in chapter six, a cyborg is a neologism which combines the terms cybernetics and organics to reflect the merging of cybernetic devices and biological entities. Originally used in

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[8] Whilst Barbour may have neglected the cultural implications of IT, at least he offers an ethics of information technology that reflect contemporary concerns. The conclusion of his chapter on computer technology argues that a theological ethics of computer technology needs to be mindful of the following points: personal fulfilment in work, social justice in relationship to the information gab between the developed and developing world, participation in the collection and dissemination of information, concern over economic development in light of human need, sustainability of the technology, and environmental concern. *Ibid.,* 175-6.

[9] Elaine L. Graham, *Representation of the Post/human: Monsters, Aliens and Others in Popular Culture* (Manchester: Manchester University Press, 2002).

[10] Graham Ward, *Cities of God* (London: Routledge, 2000), 206.

theoretical astronautics[11] the term is most famously applied in science fiction and cultural theory, where a cyborg is the emblematic example of the posthuman/postmodern subject living within a technological culture. For Ward, cyborgs are an example of an ontological 'hybrid', something which resonates with the biblical symbol of the 'Angel', as that which is both like humans and other than humans. The cyborg serves as a technological other, whose image (whether fictive or real) forces humanity to revaluate its own position in relationship to technology. Well before Ward explores the social aspects of computer-use in the penultimate section of *Cities of God*, he reflects on the modern-day creation of the cyborg through the human use of contemporary technologies:

> What has changed in today's interest in the hybrid and in the angelic is twofold. First, the hybrid is no longer the monstrous other out there, the other that must be kept out there, kept at bay (like Stevenson's Mr. Hyde). The hybrid is part of the social; we are all recognised to be hybrids now for the natural order has buckled and warped. With our implants, pacemakers, false teeth, cosmetic surgeries, contact lenses; with our diet over years of genetically engineered food; with our notions of hygiene; with the pharmaceuticalisation of our bodies and the electronic extension of these bodies (mentally with computers, mystically with cars and planes and space shuttles) – we are already becoming cyborgs...[12]

For Ward, the internalisation of technologies has challenged the way in which those within cyber-culture construe what Elaine Graham would term 'ontological hygiene.'[13] Yet for Ward it also threatens to undermine the hygiene of community, as well. Cyber-communities, like cyborg persons, are constituted in part by their technological substances. This seems in Ward's estimate to serve as a direct threat to the image of Christian community, which is humanity's co-operative participation within the broken body of the Crucified Christ.[14] It would seem that Ward is sceptical of communities that are constituted through mediation, when mediation is a substitution for, or ancillary to, Christology or the Eucharist. Ward believes that community is only authentic when it

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[11] Manfred Clynes and Nathan S. Kline, "Cyborgs in Space," in *The Cyborg Handbook* ed. Chris Hables Gray (New York: Routledge, 1995), 30.

[12] Ward, *Cities of God*, 210.

[13] Graham, *Representation of the Post/human,* 11.

[14] Ward, *Cities of God,* 108.

approaches unmediated sociality, or at least a form of sociality that is only mediated through a theological event.

Is Ward correct that community is only authentic when it is constructed of pure unmediated face-to-face sociality? Can the meditative effects of technology (especially computer technology) foster an authentic virtual community which inhabits the virtual-space of cyberspace? At least with respect to information technologies, Ward would answer this question with a definitive 'no', as he regards the disembodied ethos of cyberspace as nothing more than a modern-day technological incarnation of quasi-utopian hopes that have extended throughout western culture, manifesting themselves in Plato's Republic, Bacon's Utopia, and more recently in the myths promulgated by media, commerce and fiction.

In order to bring cyber-culture into a redemptive relationship with theology, Ward seeks to unpack and then dismiss the implications of virtual community. This is done first through an analysis of the modern city and then subsequently by an analysis of the networked city of which he terms variously 'virtual reality' or 'cyberspace'. In either the real city or the virtual city, Ward describes how the urban landscape reflects and distorts the hope-filled vision of the eschatological city of Christian theological hopes. Consideration of the urban landscape is not a particularly new exercise within theology. Cities have always held a fascination for Christians, whether the archetypal wicked city of Babylon and the archetypal heavenly city of Jerusalem in Scripture, or the City of God and the City of the World in St. Augustine's own *City of God.*[15] What is noteworthy about Ward's project is that he places alongside the 'real' urban city of the postmodern

[15] For an interesting contemporary to Ward, see Paul Tillich, "The Technical Society As Symbol (1928)," in *The Spiritual Situation of our Technical Society* ed. J. Mark Thomas (Macon, Ga.: Mercer University Press, 1988), 179-184. In this lesser known Tillich essay, the entire enterprise of human city building is seen as a retreat from nature, that is from the unfamiliar, into a world of familiarity. However, the density, autonomy, and oppression of the modern metropolis have consistently fought against the drive to uncanniness by ever re-creating the social alterity of the natural world.

age the virtual city of cyberspace, posing to the latter the same question which haunts his analysis of the former: Can this type of city be redeemed?[16]

An analysis of cyber-culture is necessitated, Ward argues, because in the modern world, 'Christians stand at a point in time...when reading the signs of the times brings with it the recognition that we are all immersed in symbolic processing. Many of us in advanced countries are living in symbolic environments.'[17] For Ward, the symbolic environment of the computer is instantiated in the mythic world surrounding cyber-culture, virtual reality, and the hyper-connectedness of the virtual city. These all reflect what is promoted as the 'scientific solution to the death of God.'[18]

Ward's theological evaluation of cyber-culture proceeds along three lines: 1) postmodernity's involvement in the creation of cyber spatiality leaves it without resources for critical analysis of cyberspace; 2) cyberspace promotes a kind of atomism which ultimately has dangerous implications for global ethics and politics; 3) the answer to these problems comes through a reassertion of theology's 'analogical and participatory world-view that counters, by contextualising, the reduction of the real to the digital.'[19] For Ward, the problem of cyber-culture is that a) it reduces the 'real to the digital' and b) its atomistic framework dismantles social-ethics. The solution to these two problems cannot come from the society which gave birth to cyber spatiality. Ward asserts that a solution to (or salvation of) cyber-culture must come from out with culture in the form of the Christian message of redemption. This message counters the digitisation of the self in cyber-culture by reasserting the embodiment of the self in Christian community. Likewise, rather than seeking after the freedom found in the virtual city, the Christian message

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[16] The urban analogy for cyberspace was popularised by cyber-punk author Neil Stephenson in his 1993 cyber-punk novel, *Snow Crash.* Here, Stephenson refers to his own prognostic vision of the internet as the 'Metaverse', a fully immersive virtual space where users don avatars and co-mingle in a world that replicates a late 20th century high street, complete with litter, advertisements, crowds, traffic, mores, and street violence.

[17] Ward, *Cities of God,* 245.

[18] *Ibid.,* 247.

[19] *Ibid.,* 248.

offers salvation in the form of the Heavenly City. Ward attempts to evangelise cyber-culture, putting it into contact with a theological corrective that is draped in postmodern and theological language.

To be sure, there are many resonances between the thesis argued here and Ward's own project. Like Ward, I am seeking to place theology into a redemptive dialogue with technology, thereby overcoming the tendency towards cybernetic totalism and technological essentialism that is at play within the actual, idealised, and imagined appropriations of information technology within the cultural sphere. Furthermore, I agree with Ward that any hope that is placed in technology as an object of ultimate significance is a hope that seeks to usurp the transcendent hope of Christian faith by replacing the object of ultimacy with human technical potentiality. I disagree with Ward, however, when his critique of technologically mediated sociality loses its grounding in real-world technological practices, which it seems to do in light of his confused misreading of virtual reality and cyber-culture.

Ward out of hand dismisses the potential for authentic sociality amongst 'virtual' communities not because he looks at the actual experiences of such communities but because he seems unfamiliar with the relationship between virtual reality and cyber-culture. In sum, Ward attempts to offer redemption to 'cyber-culture' by calling cyber-culture vacuous, empty and vain. He provides a redemptive solution to the problem by emptying the cyber-culture of any real significance. I believe that his negative response to cyber-culture is actually based on his misunderstanding of what kind of culture cyber-culture is.

As has been mentioned in the previous chapters, technologies are central to what it means to be human, inasmuch as they function as material indicators of self-transcendence and the propensity to openness to the world, two facets central to both philosophical and theological understandings of personhood. As was discussed in chapter four, and will be revisited in chapter six, it is the capacity for human beings to reach out to the other through self-transcendence and to reciprocally receive

the other through openness to the world, which constitutes the two movements of subjectivity.[20] But, does self-transcendence in sociality require the proximal and embodied presence of the other? Can self-transcendence be experienced in reading letters, talking on the telephone, writing emails, reading fiction, engaging in worship, or participating in multi-user online chats? To be sure, information technologies mediate communications, but as noted below, there is no reason to assert that technological mediation in real-life practices of communication destroys the communication event. For one who is interested in real-life cities and their redemption, it is unusual that Ward neglects the real-life dimension of cyber-space and the impact of information technologies on real world communities. Whereas Ward seems to argue that cyberspace dissolves community by positing an inauthentic form of sociality, recent empirical data indicates that communities which participate more frequently in 'virtual' communication actually engage in more frequent and fulfilling face-to-face communication events.[21] If Ward's prejudice against virtual sociality fails to be grounded in actual data, where does his bias come from?

Ward argues that efforts to engage in self-transcendence in the virtual-environment are always aborted in light of the illusory nature of the virtual state. He argues that contrary to its stated aims cyberspace is not about networking, but is rather about commerce: the exchange data and the consumption and production of information which is carried across a network.[22] In sum, while

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[20] Max Scheler, *Man's Place in Nature*, trans. Hans Meyerhoff (Boston: Beacon Pres, 1961), 37. :. Wolfhart Pannenberg, *Anthropology in Theological Perspective.* (Philadelphia, Pennsylvania: The Westminster Press, 1985), 61ff; *What is Man? Contemporary Anthropology in Theological Perspective.* (Philadelphia: Fortress, 1970), 71; *Systematic Theology.* (Edinburgh: T&T Clark, 1994), 197; See: Paul Tillich, *Systematic Theology*, (Digswell Place, Welwyn, Herts, England: James Nisbet & Co. Ltd., 1964), 1.188, 3:41.

[21] For empirical data supporting this assertion, see Berry Wellman and others, "Connected Lives: The Project," in *Networked Neighbourhoods*, ed. Patrick Purcell (Berlin: Springer, 2006), available online at: http://www.chass.utoronto.ca/~wellman/publications/ConnectedLives/purcell-CL-12a.pdf. Wellman et al, argues that the size of personal communities has increased with the use of internet communication technologies (ICTs), corresponding to increased recourse to durable goods and emotional support. ICTs are not separate virtual spaces but are increasingly an integral part to the lived life.

[22] Ward, *Cities of God*, 250.

face-to-face sociality encourages embodiment, Ward believes that the anti-social ethos of cyberspace promotes complete disembodiment. For him there can be no true sociality without physicality.

> The logic of the move from cities to cyberspace becomes clear. For cyberspace is announcing that it can provide with those modern cities of aspiration and those post-modern cities of endless desire both promised. Cyberspace is the outworking of modernity's dominant modes of thinking with respect to space. It is the final development in secularity – that is, the belief in the self-validation and self-containment of this world, a world without transcendent values, a world to which God is dead...[23]

No longer an 'aid, a tool, a prosthesis extending human capacity,' technology for Ward has become an 'an environment, a culture, that is re-enchanting construal of the real and the world.'[24]

The judgment which Ward makes against technology is rooted in his fundamental misunderstanding of the nature and use of actual information technologies. Rather than engaging in their material or historical roots, Ward examines what he sees to be their essential natures and commits cybernetic totalism by arguing that the use of cybernetic technologies in the technological act fundamentally devalues communication. Indeed, as was noted in chapter four, information technologies challenge the communication event, but Ward appears to be arguing that communication through information technology makes impotent the dialogic event.

Moreover, for Ward, cyberspace and virtual reality are treated as one and the same thing. Throughout the penultimate section and specifically in his conclusion, he uses the terms synonymously.[25] Although this confusion would on first blush appear to only be a minor semantic oversight, it reveals something considerably profound about his underlying philosophical

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[23] *Ibid.*, 252.

[24] *Ibid.*, 253.

[25] Having just talked about cyberspace, he writes: 'Analogically contextualised, the internet and the virtual communities it establishes, could then supplement our social relatedness and we would employ the computer prosthetically. This vision would constitute the theological response, and interjection, to the culture of virtual reality which is the non-foundational foundation for the contemporary city.' Ward, *Cities of God*, 256.

assumptions regarding technology and the subjectivity which cyber-culture encourages.[26] Ward believes that cyberspace sociality is essentially vapid because he understands cyberspace to encourage a form of disembodied atomism. Selves which are plugged into the cyberspace network cease to be selves in the strict sense because a) they lose their physical reference and as a result b) they lose their communal embodiment. As noted above, his thesis is not supported by empirical fact. Instead, Ward appears to be reiterating the conflation of cyberspace as virtual reality that stems from his reading of Slavoj Žižek, rather than from any first-hand familiarity with the actual nature and practices of virtual reality or cyberspace, themselves.[27] In pursuing an analysis of cyberspace and virtual reality, a fundamental question must first be asked regarding the relationship between these technological buzz words and so-called real-reality. This critical taxonomic pause seems missing in Ward's own work.

Is virtual reality really no reality at all? Could it be that talk of virtual reality is an empty signifier describing a mere husk of reality that has been emptied of all of its contingencies, risks, errors, unpredictablities? Is not the very moniker, 'virtual reality' a capitulation to cybernetic totalism, the belief that the real world is more real when represented in a computer? Albert Borgmann notes:

> The computer, when it harbors virtual reality, is no longer a machine that helps us to cope with the world by making a beneficial difference in reality; it makes all the difference and liberates us from actual reality.[28]

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[26] Also, Ward sees technology as primarily being a tool, but fails to acknowledge that the tool's tool-ness ceases to be differentiated from one's own being at the point in which one takes on the tool as prosthesis – the type of tool use which Ward admonishes. His concern over cyborgisation is undermined by his admonition to tool differentiation. Tools cannot be objects once they receive subjectivity from one's self.

[27] Slavoj Zizek, *The Plaque of Fantasies* (London: Verso, 1997), 139, 155, 156, 164. This portion of Zizek's early work is used extensively in Ward definition of community. See Ward, *Cities of God*, 147-50; 168-70.

[28] Albert Borgmann, *Holding on to Reality: the Nature of Information at the Turn of the Millennium* (Chicago: University of Chicago Press, 1999), 83.

I believe that Ward has made a crucial error in his analysis of the technological city, virtual reality, and the cyborg. He has given into the illusory attraction of the virtual and ascribed to it a substantial essence that it neither warrants nor deserves. Again from Borgmann,

> Though information theory and technology do not by themselves support the claim that they will greatly enhance *information about* reality, they may more plausibly encourage the hope that a precise understanding of the possibility space of information would put at our disposal powerful *information for* the shaping of reality and enhance our freedom and expression and artistic creativity.[29]

Secondly, by describing virtual reality and cyber-culture as atomistic, Ward neglects the centrality of networked-language within posthuman discourse. True-network culture is not about atomism, but about connectedness. Although Ward is keen to use the work of Bruno Latour to reinforce his own understanding of the hybrid, Ward seems unaware of Latour's work in network theory and technoscience, with respect to cyber-culture.[30] For Latour, technoscience is indicative of the tenuous and fragile nature of the epistemology (or anti-epistemology) of the modern sciences. The term connotes the inter-connected nature of scientific thinking, which is at one time grounded in all past scientific achievements, made meaningful only in the face of all future scientific interpretations, and made possible by the necessities of technological mediation. In sum, it is a network:

> the word network indicates that resources are concentrated in a few places – the knots and the nodes – which are connected with one another – the links and the mesh: these connections transform the scattered resources into a net that may seem to extend everywhere.[31]

This net is rather like the knitted fabric which embraces the cold shoulders of western culture like an old woman's afghan shawl – barely providing either cover or protection, but through the illusion of these virtues, giving comfort and meaning. It is not about substantialist metaphysics or

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[29] *Ibid.*, 138.

[30] See Ward's use of Latour: Ward, *Cities of God*, 208; 209; 215; 222.

[31] Bruno Latour, *Science in Action: How to Follow Scientists and Engineers Through Society* (Milton Keynes: Open University Press, 1987), 180.

atomism; it is about connection and the *gestalten* of the network. I fear that Ward has misunderstood network theory, despite his many references to it.

The atomism of the networked virtual-society is a result, for Ward, of the disembodied nature of virtual reality which is ever in conflict with real reality. Virtual reality is the construction of an immersive computer environment where a user operates a software system and experiences the computer environment as though he or she is 'within' the computer. Prominent examples of virtual reality come from science fiction films such as the *Lawnmower Man* (1992) or the *Matrix* trilogy (1999, 2003), where characters exist either partially or principally within artificially constructed computer environments. Despite the popularity of the trope within certain strands of science fiction literature and film, the actual use of virtual reality technology in computer applications has been met with considerable resistance, in part because of the tremendous technical hurdles which must be overcome in order to create a convincing immersive environment. The present trend towards embodied or ubiquitous computing, as discussed with in chapter four in connection with Paul Dourish's work, represents a trend in computer design away from virtual reality, to computation within real-reality.[32]

Philosopher of technology and phenomenologist Don Ihde offers a useful comparison between virtual reality and real-reality, which we can enlist in our critique of Ward's naïve understanding of technology and embodiment. Although 'technology can radically transform the situation, including one's sense of one's body'[33] the immersion of one's body in Virtual Reality does not eject one from the phenomenal lifeworld. 'In a broader phenomenological sense, both RL [Real Life] and VR are part of the lifeworld, and VR is thus both "real" as a positive presence and a part of RL.'[34]

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[32] Indeed, mainline science fiction film has also moved away from the image of immersive computing, in favour of ubiquitous computing. Contrast *Lawnmower Man, eXistenZ,* and the *Matrix*, all films from the 1990's which presented cyberspace as that which is other than the real-world, with *Minority Report* (2002), or *The Island* (2005), which feature technology as something which is completely integral to the lifeworld.

[33] Don Ihde, *Bodies in Technology*, Electronic Mediations (Minneapolis: University of Minnesota Press, 2002), 7.

[34] *Ibid.,* 13.

The issue in VR is the appearance of instrumental reason, that is to say, the ability of the technology to mediate the appearance of reality and bypass or usurp one's own responsibility for reasoning. Instruments relate a vision of the world which can encourage one to perceive the world in the way in which the instrument dictates. As noted in chapter three, Ihde argues that instruments can provide us with a 'second sight' which emerges from the tool, giving the universe a texture that raw perception does not allow us to have.[35] One who uses a telescope or a microscope to inhabit the world of the stars or the world of the Petri dish would not be understood as one who leaves his or her body in the pursuit of this new vision. Rather, that person is firmly planted on the soil of earth, although their perception of the world might be extended. Although technology can change our sense of body, our body remains the same.[36] The same is true for those who use computers or engage in what Ward calls virtual reality or cyber-culture, the computer does not change embodiment, but merely provides another way of seeing the world.

In the world mediated to us by technology we do not lose our body, but rather gain a body. We have the reflexive body which is the situational context wherein our lives are physically embedded. Yet through the use of technologies we gain a second body, a cultural or socially constructed body which is added to by the tools we use.[37] Ihde's comment on the embodiment issues raised by VR is helpful at this point:

> I obviously believe that our current enchantment with this family of virtual reality machines is just as much an enchantment with a mechanic fantasy as early modernity found itself enchanted with its own epistemology machine, the *camera obscura.* Yet if we were to take my computer-cyberspace machines as epistemological engines, one could see what kind of subject they would have....the virtual subject is multiple, not identical. As the avatar example indicates, there are many roles and personalities that the wired subject can take. Every new situation provides new relations and new possible identities. Cyborg identities are thus more like the multi-screen images in news rooms, and as individuals we can edit our beings by switching from one screen to another.[38]

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[35] *Ibid.,* 46-7.

[36] *Ibid.,* 7.

[37] *Ibid.,* 70.

[38] *Ibid.,* 85.

It would appear that Ward reads into cyberspace an overly imaginative interpretation of virtual reality, which is not only rooted in an idealised understanding of information technology but also reflects an obsolete notion of actual virtual reality technologies. The fears that are voiced by ward regarding disembodiment and VR originate from his reading of Žižek on cyberspace and VR,[39] and not from any first-hand research into Virtual Reality technologies themselves. The principal mistake here is that an idealised understanding of technology, which like those of the speculative scientists in mentioned chapter eight, is confused with a realistic approach to technology (as offered in chapter four). Rather than a harbinger of disembodiment, VR (or IT more broadly), adds to the experience of embodiment by facilitating a fictive extension of the body. Rather than losing one's body, the body is extended in a way hardly different from the extension of body through reading fiction and placing oneself in a fictional character's position.

From its creation in the late 1930's to the present-day, the computer has revolutionised itself time and time again, with each technical shift redefining its social and vocational implications. As the deficiencies in Barbour and Ward's approaches indicate, staying abreast of these cultural and technological trends is exceedingly difficult. What was once an elaborate scientific calculator is now a machine used for real-time information processing implemented symbiotically alongside its user.

> We created the computer to serve us. The notion that it might become our master has been the stuff of science fiction for decades, but it was always hard to take those stories seriously when it took heroic efforts just to get a compute to do basic chores. As we start to accept the World Wide Web as a natural part of our daily existence, perhaps it is time to revisit the question of control. My hope is that, with an understanding of history and a dash of ...scepticism, we can learn to use the computer rather than allowing it to use us.'[40]

The apparent complexities of past information processing methodologies meant that the different roles of the computer and computer user were patently clear. Computers processed the information

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[39] Ward, *Cities of God*, 149ff.

[40] Ceruzzi, *A History of Modern Computing*, 350.

and the humans assigned information its hermeneutical value. Today, this distinction is increasingly 'blurred or at least complicated by the advent of modern operating systems that use, and frequently abuse, the power of metaphor to make computers accessible to a larger audience.'.[41] The two tiered system of hardware and software becomes increasingly difficult to decode when computer software is created which seeks to transparently link user and terminal. The metaphors employed in contemporary IT language – 'desktops', 'windows', 'scrolling', 'chat' – all seek to blur the distinction between the virtual world of the computer, and the less-than virtual world of flesh and blood embodiment. Yet to forget that the computer is anything but an object alongside other objects in the world, to reify the virtual as that which is juxtaposed to the real, is to give way to technological essentialism. To return to Ward's use of cyborgs, our bodies may very well be immersed in a culture of technology, but we are still our bodies, we still have our bodies, and it is only when the fictional world opened up by technology is misunderstood that the body and the self is swallowed up by 'cyber-space'.

Ward rightly addresses the mythic significance of technology as a bearer of meaning that transcends its material and historical form. Indeed, it is in the interface of the two competing mythic worlds discussed by this thesis – the techno-theological myths and the myths of Christian theology – that we begin to see the conflict between these two competing theological models. The former, techno-theology, appeals to technological essentialism and cybernetic totalism to advocate human creativity as the succour for existential need and the true path to human authenticity. The latter, a *kerygmatic* theology of technology, posits that it is only that which transcends the world (the Christian *kerygma*) that can truly make us worldly. Though Ward is primarily correct in his assessment of technology, by building his argument from idealised rather than realistic technology, we leave him with no suitable ethical ground from which to respond to technology. Though we can clearly see the deficiencies in the technological myth reflected in their idealised rhetoric we are not given a set of practices by which we can successfully engage the real technological world. As we shall note in the remaining two topics of this chapter, it is precisely this move away from realism

[41] Neal Stephenson, *In the Beginning...was the Command Line* (New York: Perennial, 1999), 11-12.

towards idealism which bind the hands of a theology of technology from providing a notion of ethical technological practices.

Cognitive Science

Information theory, as was discussed in chapter four, deals with the process by which information is mediated within information processing systems. With respect to computerised information, layers of abstraction separate the computer user from the underlying digital binary code which controls the functions of a computer. Yet, this code would have no meaning (at least apart from a very few highly-skilled computer scientists) without the many mediating layers which not only abstract, but interpret this code for the computer user. The translation of code into meaningful information has given the computer the appearance of a secondary hermeneutic device, which interprets the vaguely expressed intentions of the computer programmer into meaningful bits presented dumbly in view of the computer user.

Unlike other technologies which may extend human senses, will, agency, or power, computers have the unique ability to convey the appearance that they extend that which is most internal to the human-tool-user: cognition. By possessing what is called a 'memory', by processing, calculating, interpreting and displaying information, and by engaging in forms of communication, computers appear to replicate the interiority of the human subject. In what follows, I will argue that this appearance is an illusion which reflects the capitulation to cybernetic totalism within strands of cognitive science and artificial intelligence research over the past 40 years.

The paring of human consciousness and machine consciousness was noticed by cognitive scientists in the late 1950's when they began to make parallels between the processing of information in computers and the processing of information in the human brain. According to Theodore Roszak, thanks in part to what in chapter four was identified as von Neumann architecture, computers have been perceived to process information in a manner that 'somewhat corresponds to what we call memory in human beings.' His observation takes a somewhat conspiratorial turn when he asserts that, 'It is no great difficulty to persuade the general public of that conclusion since computers process data very fast in small spaces well below the level of

visibility... [t]hey seem to be running along as smoothly and silently as the brain does when it rammers and reason and thinks.'[42]

The illusion of cognitive similarities between the computer and the human brain was first formally argued for by George Miller in 1956. His theory asserted that the brain was a basic information processing device akin to a computer, and like a computer could only accept a certain number of 'bits' of information at a given time.[43] The trend reflected in Miller has continued in the present-day, most notably by AI researcher Marvin Minsky and philosopher Daniel Dennett. Minsky's *The Society of Mind*, has argued for something similar to a component object model of software development, as the means of explaining the experience of consciousness. His reductionist approach sees human cognitive functions as being comprised of small reducible components which can ultimately be replicated in an artificial intelligence machine. Minsky understands cognitive activity as nothing more than a collection of small sub-routines which are called and executed in batches. Human cognitive processing may appear to the observer as meaningful behaviour, but in reality all subjectivity is reducible to smaller meaningless activities going on within the mind.[44]

Tom Stonier, a contemporary of Minsky's, was equally as entrenched in the computational analogy of consciousness. So much so that he believed that 'any epistemological work written before the advent of computers'[45] was outdated and obsolete. The computer's role as a device which pre-sorts and pre-digests information led Stonier to conclude that machine's exhibit a form of intelligence which reflects on his understanding of human intelligence.[46] For Stonier, 'intelligence manifests itself in intelligent behaviour. There can be no intelligent behaviour without

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[42] Theodore Roszak, *The Cult of Information: the Folklore of Computers and the True Art of Thinking* (Cambridge: Lutherworth Press, 1986), x-xi.

[43] George Miller, "The Magical Number Seven, Plus Or Minus Two: Some Limits on Our Capacity for Processing Information," *The Psychological Review*, 63 (1956), 81-97.

[44] Marvin Minsky, *The Society of Mind* (New York: Simon and Schuster, 1986).

[45] Tom Stonier, *Beyond Information: the Natural History of Intelligence* (London: Springer-Verlag, 1992), 6.

[46] *Ibid.*, 107.

information processing.'[47] Unlike earlier adherents to the computational model of consciousness, Stonier states:

> human intelligence, for the most part, does not operate like a von Neumann type of logic machine. It does not...engage in precise reasoning, manipulating abstract symbols. The great fallacy – perhaps based in a kind of technological arrogance – is that the human brain works like a logic machine and that therefore, the computers created by the collective genius of men like Atanasoff, Babbage, Bush, Turing, von Neumann, and Zuse – upon perfection – would act like human brains. The fact is that the first four or five generations of computers represented machines whose information processing became extremely fast, precise, yet uncomprehending...'[48]

Even in light of the inadequacies of the traditional computational analogy provided by the von Neumann machine, Stonier retains his faith in the computer's ability to replicate human cognitive function. He calls for a new type of computer model, the neural network, which mimics the way in which the brain recognises complex patterns. Regardless of the technological substrate, however, Stonier's project represents a reductionistic understanding of consciousness, which seeks to interpret both cognition and intelligence in terms that reflect extant and future computer technology. The computer, whether a von Neumann machine or a neural network, serves as the mirror in which Stonier, Minsky, and Miller look to find a reflection of the human subject. For Stonier, until we can understand intelligence by way of computers, we will never fully understand human intelligence or even education.[49] According to these cybernetic totalists, the computer has become the paramount model for achieving human understanding.

Why do we think we are machines?[50]

Since the emergence of the machine analogy for consciousness in the 1950's, computer-like qualities have been ascribed to both the human body and mind. Though functional parallels certainly exist, the metaphor is not without its conceptual drawbacks. Chiefly, the totalising

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[47] *Ibid.*, 108.

[48] *Ibid.*, 135.

[49] *Ibid.*, 158.

[50] I am borrowing this heading from a similar chapter title in Don Ihde, *Existential Technics* (Albany, New York: State University of New York Press, 1983), 65-80.

reduction of the vastly complicated nature of human thought and action into a controllable model replicated within computer systems, assumes a form of subjectivity which makes the whole of human being reducible to the human mind's ability to process information. To be human, as stated elsewhere in this thesis, is to be engaged in self-transcendence and openness to the world. It is a state of receptivity to the world that is tempered by a deep sense of interiority, where one is constantly engaged in self-interpretation as one's being is ever reshaped by contact to the other. This fluid ability for human beings to engage in continual re-narration is at the centre of what Paul Ricoeur terms 'narrative identity' which is the process by which one's sense of self-centredness is challenged by the contact with an other, forcing the whole of life to be continually re-narrated in the presence of otherness.[51]

One could argue that if the Ricoeurian anthropology encourages re-narration or ongoing self-interpretation in light of a social-other (or a theological other[52]), perhaps contact with new and changing technologies, also within the lifeworld, would require a certain degree of personal re-narration. It would seem that Don Ihde would support the thesis that culture determines the metaphors by which identity is understood:

> Prior to the rise of Modern Philosophy in the seventeenth and eighteenth centuries, it might seem that the dominant metaphor of self-interpretation was the *imago-dei*, the human existent as the imitation of or reflection of God.[53]

What is unique in the current fascination with technology as the principal source for human self-understanding, compared to the modern emphasis on the image of God, is that rather than the creator reflecting his image upon the created, the created is reflecting its own image back on to the (human) creator. This resonates with what in the introduction was discussed in terms of Norbert Wiener's critique of cybernetics in *God & Golem, Inc.,* with regards to the loss of human identity in the continuum of creation. If humans create their equivalent in technology, do they themselves

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[51] Paul Ricoeur, "Narrative Identity," *Philosophy Today* Spring (1991), 73-81.

[52] Don Ihde, *Existential Technics*), 65-80; Paul Ricoeur, "The Summoned Subject in the School of the Narratives of the Prophetic Vocation," in *Figuring The Sacred: Religion, Narrative, and Imagination*, ed. Mark I. Wallace (Minneapolis: Fortress Press, 1995), 262-275.

[53] Don Ihde, *Existential Technics*, 71.

become gods or beasts? Clearly, if the reflection of an image is any indication as to which object is considered to be prior (the reflected or the recipient of the reflection), then it would seem in the current fascination with the computational analogy, human beings have replaced the divine with their own creations and are no longer *sub specie aeternitas* but *sub specie modus*, as it is not the image of eternity which reflects upon humanity but the finite and bounded image of human technical creativity. Despite the illusory similarity between computers and humans, Don Ihde notes:

> The computer is no more (or less) like the mind at work than a building crane is like a human arm. It does something "better" (calculates faster and if programmed correctly with less calculational error) and other things worse or not at all...just as the crane clearly amplifies the power of lifting and strength far beyond that of the human arm but would be hard put to pick up a needle or tickle a pussycat.[54]

The desire to make machines the originating image of human identity reflects a trend that has been identified in this thesis as techno-theology – the tendency to make human material creativity the new ground or foundation for ultimate concern. As theorising about IT becomes alienated from real technologies, we begin to note how such idealised technologies function increasingly as purveyors of theological significance, giving rise to symbols that point inauthentically to ultimate concerns.

AI

As we come to the third and final subject of this chapter, we will note the last example of how theorising about technology can break free from its anchor in real technologies. In Ward's analysis of cyber-culture, we encountered the disintegration of human community in the face of electronic mediation. In the analysis of cognitive science research, we traced the tendency to view the human mind as a kind of information processing machine. Lastly here, within artificial intelligence research, we will note the drive toward regarding information technology itself as the potential bearer of human mind. Whereas cognitive science evidenced a tendency towards cybernetic totalism, artificial intelligence research reveals more of a proclivity for technological essentialism,

[54] *Ibid.*, 75.

arguing that computers will (or do) posses an essential nature. The problems raised by contemporary artificial intelligence research, though expressed primarily in idealised forms of technology, are treated more fully in the imagined or speculated technologies described in section two. In this chapter we will side-step posthumanism for a moment, and centre instead on the current practices of artificial intelligence research and conclude by dialoguing with Noreen Herzfeld and Anne Foerst, two leading AI researchers who take into account the theological status of AI beings.

As noted above, AI traces its origins to the work of Marvin Minsky in the mid 1960's. He pursued the concept of universal computation, which asserted that the computation in the human brain was functionally equivalent to computation in a computer). The underlying object of AI research is to use computer technology to attain some form of machine intelligence (a term not unanimously defined). As one would expect, artificial intelligence research includes a variety of different approaches. Artificially intelligent neural networks attempt to use adaptive computer technology to learn how to respond to scenarios without being explicitly programmed. Similar adaptive software based systems are employed within online and electronic gaming, where AI characters learn a player's habits and adjust the gaming tactics accordingly. Most credit card fraud prevention schemes likewise use 'intelligent' software which analyse customer purchasing patterns.by scanning individual's credit card records to determine if a customer's card has been stolen. AI does not always reflect hyper intelligent machines such as the HAL 9000 of *2001: A Space Odyssey,* but can encompass a variety of less demonised forms of 'smart' programming.

Nonetheless, for many AI researchers, Minsky included, the idea of pursuing strong-AI is still the *raison d'être* of their research. Strong-AI, according to AI critic John Searle, asserts that

> the computer is not merely a tool in the study of the mind; rather, the appropriately programmed computer really is a mind, in the sense that computers given the right programs can be literally said to understand and have other cognitive states. In strong AI, because the programmed computer has cognitive states, the programs are not mere tools

> that enable us to test psychological explanations; rather, the programs are themselves the explanations.[55]

Attempts at discovering computational equivalents of consciousness are based on the assumption that current models of computation correctly correlate to human consciousness, namely that consciousness occurs along the lines of a Cartesian division between mind and body.[56] Searle uses this definition of strong-AI, to argue against any notion of computational equivalences of consciousness. He posits that 'mind' is a creation of specific bio-chemical processes in the human brain which cannot be replicated in alternative substrates without losing its fundamental context within neurophysiology. This sentiment is echoed also by phenomenologist Herbert Dreyfus, who argues that the particularity of the human instantiation of consciousness within the physical body and brain are central to the distinctly human experience of being in the world. Dreyfus writes:

> the information processing model...along with the ontological assumption, dictates an answer to this question [how do we get knowledge of the world] which is no longer neutral, but rather embodies the computer's requirements. When one asks what this knowledge of the world is, the answer comes back that it must be a great mass of discrete facts. Thus at the end of his instruction to semantic information processing, when Minsky finally asks "what is the magnitude of the mass of knowledge required for a humanoid intelligence?" he has already prejudged the question...[57]

AI research depends upon the presumption that knowledge is something that can be digitised and stored inside a machine and that the application of this knowledge, and the ability to recall stored data on cue, represents intelligence. Thus, the world of AI is objective and realist, arguing

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[55] John Searle, "Minds, Brains and Programmes," 417. This argument is supported by his well-known 'Chinese room'experiment, discussed in full in the cited article. Searle uses this definition of strong AI, to argue against any notion of computational equivalences of consciousness. He posits that 'mind' is a creation of specific bio-chemical processes in the human brain which cannot be replicated in alternative substrates without losing their fundamental context.

[56] A step of further and more helpful abstraction is taken by MacKay who notes that Searle's argument that machine's do not understand, only 'brains understand' gives too much credit to the brain, and not enough credit to the 'I'. He would argue that neither machines nor brains understand, as it is neither of their jobs to understand. The only understanding entity is the 'I'. MacKay, *Behind the Eye*, 171.

[57] Hubert L. Dreyfus, *What Computers Still Can't Do*, 208.

that there is only the concrete world 'out there' which consists of matter and objects and events. I may experience things subjectively, but if these subjective events have no correlate to the objective world, they are easily dismissible. Strong-AI research not only assumes that technology can create intelligent beings who participate authentically within human culture, but it also posits that any difference between AI entities and human beings is essentially a quantitative rather than qualitative matter. Strong-AI entities are on a continuum of intellect and emotion alongside their human counterparts, implying that given adequate time such beings could become equal to (or greater than) their human creators. To explore whether or not such claims impact Christian theology, I offer Noreen Herzfeld and Anne Foerst's comments on AI and theology.

Herzfeld

Herzfeld uses the *imago Dei* as a rallying point around which human distinctiveness can be maintained in juxtaposition to AI. The *imago Dei* is discussed from three angles: the image as reason (Niebuhr), regency (von Rad) and relationship (Barth). The tripartite pattern is reused over and over again in her text to discuss the various forms of AI, the representations of AI in film, the Christian critique of AI and the ethics evoked by technology in general. Her text clearly explains what AI is, and what AI is not. As the reader learns, complex 'symbolic AI' (referred to above as 'strong-AI') is worlds apart from the 'weak AI' which is commonly encountered through our day-to-day use of computer technology. Despite the uninspiring reality of AI at the present, the text takes seriously the claims made by those involved with cutting-edge research into symbolic AI, and speculates as to the potentials for advanced AI in the future. According to some of the text's sources (Ray Kurzweil in particular) the future of truly human-like machines is a real possibility within the next 70 years. Yet the text is quick to temper such speculations with the reality that oftentimes technological prognostication is so much optimistic guess-work.

Faced with the less than riveting reality of AI today and the overly optimistic promises of AI in the future, *In Our Image* abandons fact for fiction, and journeys into the representations of AI in film. Film's broad appeal and easy accessibility makes it the perfect medium for discussing popular conceptions of AI in culture, and the text offers a well reasoned (and again highly systematic) reading of popular AI characters in films such as *Star Wars, 2001: A Space Odyssey,*

and *AI*. The text concludes with two chapters, intended to further tease-out the theological and ethical impact of AI. 'Why Create an Artificial Intelligence?' examines the potential motives fuelling AI research. The last chapter, 'Towards a Human-Computer Ethic' fleshes out humanity's responsibility to AI and to all of creation in general. This ethic is based upon the maximal teachings of the Rule of St. Benedict, which implore humans (as creatures and creators) to attend to the material world on the principal that all matter is ultimately owned by God and in the custodial care of humanity.

In Our Image provides a brief, yet informative, introduction into the interface between speculative and real AI and theology. But its brevity prevents it from sufficiently engaging in the broader theological and cultural dialogues. As a result, it fails to sufficiently engaging with the subject, despite its own claim to be an 'extensive theological engagement with the field of...AI'[58].

Foerst

Herzfeld's project was preceded by the more well-rounded and scholarly critical work of Anne Foerst, who is the self-titled 'theological advisor' for the robots Cog and Kismet, the emotive AI 'bots' at MIT. Foerst's involvement in the MIT 'God and Computers' project and her many articles on the subject, give her considerable authority on AI and theology.[59] Foerst's approach to AI is one which seeks to simultaneously argue for the created dignity of artificial beings and for a symbol-driven theological method in the science-theology dialogue. Both her method and her approach to AI will be discussed below.

Foerst's theological method encourages an engagement between science and theology which allows interaction without judgment or impingement. She wishes to establish a dialogue between the two disciplines, but does not wish either side of the dialogue to inhibit the creative processes of the other. Within the science-theology dialogue she sees two principal theological methods at play:

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[58] Noreen Herzfeld, *In Our Image: Artificial Intelligence and the Human Spirit*, Theology and the Sciences, ed. Kevin J. Sharpe (Minneapolis: Fortress Press, 2002), back materials.

[59] Foerst has recently published a monograph summarising her research into emotive AI, but the text was not released in time for consideration in this thesis. Anne Foerst, *God in the Machine* (New York: Dutton Adult, 2004).

the 'Cartesian approach' and the 'symbolic approach.'[60] The difference between the two is described by Foerst as a difference between an epistemology which seeks to address issues related to the objective nature of the cosmos (the Cartesian) and an epistemology which seeks to construct the world through what she describes as a hermeneutic approach (the symbolic). The former is concerned with gaining information about the world as it really is, whereas the latter is content with interpreting the world as it appears to the subject:

> Rather than take scientific theories and theological concepts as mere descriptions of reality, I want to understand them as symbolic hints towards something deeply connected to who we are. Science in the context can be interpreted as not simply adding to the treasure of objective knowledge about the world and ourselves under the Cartesian assumption. Rather its description of reality "comes across to us yet another story that tells us about ourselves"'[61]

Her approach to the science-religion issue reflects her earlier research into Paul Tillich's theological method viz. the natural sciences.[62] Her interest in 'the symbol' appeals to a narrative reading of the sciences, taking stories that emerges from a science like AI in connection with the story that emerges from theological confession. In an earlier *Zygon* article on the same topic Foerst wrote:

> The desired result of a dialogue within this framework would be acceptance, by people in both AI and theology, that their incompatible worldviews can be proven neither right nor wrong. Both sides can enrich each other, providing additional insight into the mystery of humankind – and Victor Frankenstein and his creature can finally become friends. Frankenstein will be able to accept that his creature – for him a kind of machine, an objective thing – has in fact become a human being with subjectivity, with ambiguities,

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[60] Anne Foerst, "Cog, a Humanoid Robot, and the Question of the Image of God," *Zygon*, 33, no. 1 (1998), 93.

[61] Anne Foerst, "Cog, a Humanoid Robot, and the Question of the Image of God," *Zygon*, 33, no. 1 (1998), 98. Quoting from Philip Hefner, *The Human Factor: Evolution, Culture and Religion,* (Minneapolis: Fortress Press, 1993), 12.

[62] Foerst's PhD dissertation was entitled, *Künstliche Intelligenz und Theologie: Ein Diskurs und seine Perspektiven auf der Grundlage der Theologie Paul Tillichs* [Artificial Intelligence and Theology: A Discourse and its Perspectives Based on the Theology of Paul Tillich]

> with the need to be respected. The creature is able to understand Frankenstein and his wish to build it and can accept itself as a creature.[63]

By investing the symbols which emerge from scientific research with a type of subjective value akin to the objective value reached by the Cartesian approach, Foerst seeks to argue that the subjective symbol-based characters of AI are given the same fictive ontological status as any other creation.

Foerst specialises in embodied forms of artificial intelligence which relate to their users through emotional and social intelligence rather than strict rational intelligence. Unlike classical forms of AI research which have attempted to programme as much information into the AI software as possible, the software underlying Cog and Kismet is not information-rich but relationship-rich; these robots do not provide cognitive counterparts as much as they provide emotive responses.

Without tracing the entirety of her project, Foerst seeks to argue that the emotive, social, and communicative facets of humanoids, that is, embodied AI characters, compliment a symbolic reading of the concept *imago Dei* by providing a parallel to emotional/relational characteristics that she sees as being traditionally the purview of theological anthropology. In short, embodied AI devices share in the human capacity for the image of God and are created entities that should receive the same dignity as any other created entity.[64]

A similar approach to the dignity of artificial entities has been taken by Robert McShea, in regards to the importance of emotional sociality. McShea argues that if given the choice between being stranded on a desert island with a being that looked like a lion, but communicated and reasoned like a human, or a creature that looked like a human but communicated and reasoned like a lion, most reasonable people would choose the being that was emotionally similar, despite

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[63] Anne Foerst, "Artificial Intelligence: Walking the Boundary," *Zygon*, 31, no. 4 (1996), 692.

[64] Her thesis is also argued for by Polish cyberneticists Stanislaw Lem, who argues that human-like robots should be treated with the same kind of ethical responsibility as humans themselves. Stanislaw Lem, "Robots in Science Fiction," in *SF: The Other Side of Realism* ed. Thomas D. Clareson (Bowling Green, KY: Bowling Green University Popular Press, 1971), in Patricia S. Warrick, *The Cybernetic Imagination of Science Fiction* (London: The MIT Press, 1980), 21.

dissimilarities in form. He cites children's stories which make references to creatures that are dissimilar in form to humans, but which respond to scenarios according to a human ideal. Human behaviour and the predictability of human behaviour are central components of sociability, which transcend the biases that differences in form may convey. In Foerst's case, if an artificially intelligent bot responds in terms which are relatable to human emotive response, this bot can be seen as sharing a fundamental resonance with the symbols that constitute humanity.[65] Foerst, speaking of her own emotive bot, Cog, notes that:

> Cog is a creature, created by us. The biblical stories of creation describe us an all living beings as creatures created by God. On that ground, God's creative powers are mired in Cog. The Cog project also tells us a story about the human creative powers that are a part of the image of God. The Cog project does not necessarily have to be understood as a hubristic attempt to be like God but can be seen as a result of our God given imagination and courage to create something new.[66]

For Foerst, more than tools, these AI devices are actual subjective forms, they are cybernetic others who we experience in alterity in the same manner that we would experience the alterity of another. In her brief essay, 'Robot: Child of God', she reflects on the future technology of robotics, by examining the ontological/spiritual status of Commander Data from the television series and films, *Star Trek the Next Generation.* Data, she argues, because he appears as human as anyone else, has 'the attributes of personhood and dignity just like ourselves. He would be a child of God.'[67] The question of Data's ontological and spiritual status is not 'does he have a soul' or even 'does he possess the patterns of intelligence,' but rather his actions. Accordingly:

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[65] Robert McShea, *Morality and Human Nature: A New Route to Ethical Theory* (Philadelphia: Temple University Press, 1990), 77 in Francis Fukuyama, *Our Posthuman Future: Consequences of the Biotechnology Revolution* (London: Profile Books, 2003), 169. Fukuyama notes that this accounts for how in science fiction, the most disturbing others are not those who appear different to humans, but those who appear like humans be behave unlike humans.

[66] Anne Foerst, "Cog, a Humanoid Robot, and the Question of the Image of God," 108.

[67] Anne Foerst, "Robot: Child of God," in *God for the 21st Century* ed. Russell Stannard (West Conshohocken, PA: Templeton Foundation Press, 2000), 137.

> Data participates in the human community; he has friends and a sexual relationship; he is loved as a person and is not regarded by most crew members as a mere machine. Any robot which is like us, and is accepted by humans as one of us, is a person.'[68]

For Foerst, personhood is a symbolic category that it constituted on social grounds. If an AI bot functions as a social creature and is incorporated into human community, this subject is a person and, moreover, a creature that is welcomed by God.[69]

Answering the Artificial: Finding persons outside of computers

How do we respond to cognitive science or the claims of artificial intelligence research regarding the nature of human personhood in relationship to human technology? On the surface, arguing against the dispositions towards cybernetic totalism and technological essentialism – which throughout the thesis have evidenced a bias towards technology's ability to authentically reflect or support conscious mind – would seem to be a useful starting point. If technologies are simply material tools which reflect limited potential for development and are marked by the same fallenness endemic to creation, it would seem difficult to support the kind of positivistic rhetoric which surrounds the punditry espoused by those cited in this chapter.

Though one can refute these issues from the perspective of the philosophy of mind (highly nuanced refutations of strong-AI and computational equivalents of consciousness have been made in contemporary philosophy of mind, as noted in references to Searle[70], Dreyfus[71], and MacKay[72]), I am of the opinion that it is the quasi-religious predisposition to view technologies as objects of concern, which truly colours the idealised appraisal of technology noted in this chapter. Ward's fear of vapid cyber-cultures; Miller, Stonier, Minsky and Dennett's faith in the computer as an

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[68] Foerst, "Robot: Child of God," 137.

[69] *Ibid.*, 140.

[70] John Searle, *The Mystery of Consciousness.* (New York: New York Review Press, 1997); John Searle, "Minds, Brains and Programmes," *Behavioral and Brain Sciences* 3 (1980), 417-457; John Searle, "I Married a Computer," *The New York Review of Books* 46, no. 6 (1999).

[71] Hubert L. Dreyfus, *What Computers Still Can't Do: a Critique of Artificial Reason* (London: The MIT Press, 1992).

[72] Donald MacCrimmon MacKay, *Behind the Eye*, ed. Valerie MacKay (Oxford: Basil Blackwell, 1991); Donald MacCrimmon MacKay, *Information, Meaning and Mechanism* (MIT Press, 1969).

authoritative answer to the mysterious questions regarding the nature of mind; and Herzfeld and Foerst's reflections on the authenticity of artificial beings in relationship to a loving God, all reflect what is at heart the appropriation of technology as something more than just a material tool. Technology for these figures is the bearer of mythic or symbolic discourse, the purveyor of a cultural disposition towards seeing within human creativity the immanently realisable solutions to what in traditional religious symbolism has been the object of ultimate concern.

Such techno-theological hopes reflect an inauthentic form of theological discourse, which short-circuits the transcendent movement of theology towards that which is truly other, and seeks to create an immanentist basis of existential hope. Yet, relying upon materiality as the succour for human need is not a distinctly contemporary or even technological enterprise. In fact, turning to human creativity to explain human need, human origins, human destiny, is very much a part of human imagination. Well before the emergence of the issues noted in this chapter, Western thought possessed a pre-existing mythic framework that expressed concern over the limits of authentic human creativity, enlisting the human imagination in the service of theological inquiry.

This is perhaps no better illustrated than by the myth of Rabbi Loeb and the Golem of Prague. According to the story, using divined knowledge which was derived from dreams and Cabbalistic formulae, Rabbi Loeb was given instruction on how to form a living creature from inanimate clay. Going down to the River Moldau, the Rabbi, his son-in-law, and his pupil read from the *Book of Creation* and sculpted the form of a man from the wet clay of the riverside. The spark of life entered the creation when a slip of paper with the ineffable name of God written on it was placed in the clay-dolls mouth as the three men recited the phrase from Genesis 2.7, 'And He breathed into his nostrils the breath of life; and man became a living soul.'

The connection between Golem and the Judeo-Christian creation myth is both obvious and telling. Both the human creator and the divine creator read from the pre-existing words of creation to call into existence a life sculpted from clay. Likewise, much as how the divine creation went awry through human-sin, Rabbi Loeb's creation (in some forms of the myth) turned on the very community which it was intended to serve. To return the creation to the void, the Rabbi removed the name of God from the Golem's lips, much as how in response to sin, God removed his presence

from Adam and Eve by expelling them from paradise. The Golem myth reflects the belief in eastern European Judaism that the Torah was a living form of life-bearing information, which when met with a willing host could bring animation to the inanimate. The moral of the Golem myth is that unlike divine *poiesis* which brings about constructive creativity, human creativity on this scale is an act of hubris which is bound for ultimate failure.

This theme is recast in a slightly different form in Mary Shelly's *Frankenstein* story, typified by Dr. Frankenstein's quest to create life from death by employing the very spark of life itself, electricity. The resurrected creature is a confused and complicated amalgam which derives its subjectivity not through its own identity but through its creator. This point is illustrated by the popular reception of the story, wherein the name of the monster is incorrectly labelled 'Frankenstein,' a claim which is never made in Shelly's own version of the story.

Confronting Cybernetic Totalism

It has been illustrated in this chapter how a philosophy of technological essentialism, when applied within the context of the culture surrounding information technology, leads to what has been termed cybernetic totalism. IT adherents, such as those within cognitive sciences or artificial intelligence research view IT as a means by which a 'more' real or characteristic model of reality is purveyed. Those more sceptical of the beneficial capacity of IT, such as Ward, see within IT a characteristic essence which mediates an inauthentic and nefarious form of sociality which challenges if not threatens the sociality offered by Christian community. For either adherents or opponents, information technology is treated as more than simply a tool used to accomplish a particular task, but as a means of conveying a better understanding of the so-called 'real' world. Through mediation, representation, or simulation, computers are understood to unlock a greater dimension of reality than would have been available apart from digital representation. It is the position of this thesis that cybernetic totalism represents a patently uncritical and naïve interpretation of actual information technologies.

In chapter four, I discussed the material history of information technology in order to provide a counter point to the blurred realism, neigh the idealism, which has been described here in chapter five. When the material-historical approach presented in chapter four is read alongside the

hermeneutics of technology advocated in chapter three we begin to see that in contrast to the blurred realism and idealism described here in chapter five, an authentic appropriation of technology seeks to ground human creativity within broader cultural concerns, reading technology as a tool put in service of the strong values of a given culture.

With this in mind, to resist cybernetic totalism, one must subsume the cultural appropriation of IT underneath IT's material and historical development. In this light, the tendency in cognitive science and artificial intelligence research to see within IT a metaphysically superior portrait of the real world can be undermined by anchoring IT within its own finite limitations. Certainly, computer modelling of complex systems has contributed to a greater degree of understanding in many areas of life. Nonetheless, it is a false assertion to argue that computers provide a clearer picture of *all* reality. Cybernetic totalism, following on from technological essentialism, invests IT with a level of essential value that elevates this technique to a foundational reality. This is an uncritical and imprudent application of theories, models and methods of information and computing science to areas of life which exceed the logical scope of such theories.

Where then can theology turn to determine the meaning and appropriate limits of contemporary information technology? In the next section, we will move from the realist and idealised visions of technology to the place of technology within the fictive sphere. We will note how fiction and film stresses the limits of human creativity and forces society to revisit what constitutes appropriate technology. In terms of the human use of IT as a means of achieving authentic subjectivity or fulfilling ultimate concern, fiction has given us the image of the posthuman – a being who through an encounter with technology bears within its being the symbol of the human future. In the fictive imagination, the posthuman is an ambiguous subject who reveals the implications of human creativity and challenges us in the present-day to consider the nature and limitations of technological hopes. Yet, just as realistic or idealised technologies can be misappropriated through cybernetic totalism and technological essentialism, the posthuman fiction, which reflects a genuine attempt to wrestle with the dogmas of techno-theology, can itself be transduced to a form of positivism which its original playful critique sought to subvert. Despite the risks found in an overly positivistic reading of fiction, fiction will prove to be the preferred dialogue partner for a

theology of technology, as it allows theology to engage with the symbols which technology gives rise to within the cultural sphere. The theological potential of technology expresses itself not only in the creation of objects, but in the creation of technologically mediated symbols as well. Technology in our day, as a labour saving device, is an odd confluence of myth and technology.

We turn now to examine the cultural world surrounding IT, in order to read the culture of posthuman imagination and speculation through our hermeneutic philosophy of technology, rooting information technology in its material, historical and ethical situation.

Section II: Posthumanism: The Techno-Theology of IT Culture

In the future: 'we would become a collective intelligence of a type previously wholly unknown – the final conquest of death and loneliness – as humanity as we know it, would evolve beyond itself.[1]

In this section, the implications of technological essentialism and cybernetic totalism will be explored through an analysis of the posthuman discourse which emerges from IT culture. Within posthuman fiction, philosophy, cultural studies and speculative science, information technology is approached from either an imagined or speculative perspective. As a product of the fictive imagination, the image of the posthuman can be used to critique the human use of human technologies by problematising our understanding of the subject who lives within a technological context. In chapter seven, we shall note that posthuman fiction and film offers a theology of technology with a wealth of resources for arriving at an ethics of technological practices.

However, when posthuman imagery is treated as a futurological reading of human being grounded in technologically-mediated human becoming, the symbol of the posthuman can be used to represent the supposed promise of information technology to overcome finite human limitations. It will be shown in chapter eight that posthuman hopes are central to the techno-theology of the culture surrounding information technology.

The theological aspirations of posthumanism, voiced here in terms of posthuman eschatology and a posthuman soteriology, are rooted in what amounts to a faulty understanding of information technology. Through the exposition below, I will illustrate the distinction between the transcendent hopes of a Christian theology and the immanentist hopes of a techno-theology Posthuman thought seeks to posit a solution to the problem of human finitude, whether finitude is described in terms of a reversal of social inequalities viz. the hope for a utopia, or more grandly in terms of a victory over death and decay viz. the hope for immortality.

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[1] Tom Stonier, *Beyond Information: the Natural History of Intelligence* (London: Springer-Verlag, 1992).189.

Chapter 6: Approaching the Posthuman

Introduction

This chapter will introduce the topic of posthuman discourse. The term 'posthuman' will be defined and the theological implications of posthumanism will be analyzed. In the two following chapters, we will unpack the significance of two different portraits of posthumanity by reflecting on the imagined posthumans of science fiction and film (chapter seven) and the speculated posthumans of speculative science (chapter eight). Whereas the former employs posthuman imagery to critique real technological practices, the latter elevates future technologies to the point of ultimate concern. The posthuman, as a product of the culture surrounding information technology, is an ambiguous symbol which can either offer a theology of technology a language with which to critically engage with IT culture, or serve as the foundation for a techno-theological eschatology which orients the present state of human being towards its ultimate fulfilment in future human technological capabilities.

Posthumanism is the belief that through a union of human technical ability and human will, human beings will progress towards the next stage of human evolution, resulting in the 'post-human'. Although, for the purpose of this thesis my concern with posthumanism is primarily centred on the more theological dimension of posthuman discourse, I would be remiss to not acknowledge the use of the term as a reference for post-*Humanism* in the sense of a critique of Humanist philosophy. The posthuman, cyborg or so-called 'non-modern' critique of humanism cites the historical use of technology and its ubiquitous presence in contemporary life to argue that human goals, the 'good life', society, and value can only be understood in terms of the human use and creation of technology.[1] To this end, posthumanism as anti-Humanism argues that human

[1] Andrew Feenberg discusses this at length in his, *Transforming Technology: A Critical Theory Revisited* (Oxford: Oxford University Press, 2002), 28-30. For Feenberg, the posthuman as anti-humanism prosecution is indicative of Foucoult, Harraway and Latour, who would wish to use the technological elements of posthuman rhetoric to attack the humanist ideology of the 'Left'.

being can only be understood in terms of hybridisation, rather than in terms of the 'purely' human.[2] Whereas Humanism tends to advance the cause of the individual and his or her place within the community, posthumanism is characteristically oriented towards the dissolution of the individual in favour of a networked society.[3] Despite the anti-Humanism of posthuman *theory,* I argue that posthuman discourse – whether posthumanism *as* anti-Humanism or posthumanism *as* futurology – is simply an extension of the broader posthuman condition which is identified as a striving after that which is beyond the human (as in *Homo sapiens*) and not simply that which is beyond Humanism, as a philosophy.

Though posthumanism would seem divorced from the humanist agenda, it can never fully move away from impact of that which it attempts to move beyond.[4] Posthumanism confronts humanist rationalism with a decentralised subject who is divorced from reason and embedded within the natural (or phenomenal) world. Thus, it undermines the epistemological certainty by which Humanism would claim to know both the mind and the natural world, and it questions the ontological 'weight' which a Cartesian metaphysic would assign to the soul as that which signals the core of the human subject. It would also dispute the Kantian separation of the noumenal and phenomenal worlds, arguing that the subject-object binary of the enlightenment project conflicts with the holism that posthumanism sees as endemic to the lifeworld. Lastly, posthumanism reflects

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[2] An example of this is Michel Foucault, *Politics, Philosophy, Culture: Interviews and Other Writings, 1977-1984* (New York: Routledge, 1990). Here, the shifting form Foucault's thought about technology from this most fecund era (1977-84) is discussed by Foucault himself in detail. As is indicative of this sort of anti-humanist philosophy, Foucault argues that technology, either in terms material or authorial, is among the most influential forces shaping society. See: p 63 – pastoral technologies in Christianity; pp 68, 77 – technologies of power in government; p 94 – technology as central to the shaping of European modernity; p 255 – 'technologies of the self' shaping aesthetics and art.

[3] Bruno Latour, *Science in Action: How to Follow Scientists and Engineers Through Society* (Milton Keynes: Open University Press, 1987), 258.

[4] I defer here to Lyotard, whose own definition of the prefix 'post' is useful fodder for reflection at this juncture: 'You will see that when it is understood in this way, the 'post-' of 'postmodern' does not signify a movement of *comeback, flashback,* or *feedback* – that is, not a movement of repetition but a procedure in 'ana-': a procedure of analysis, anamnesis, anagogy, and anamorphosis that elaborates an 'initial forgetting.' Jean-François Lyotard, "Note on the Meaning of Post-," in *Postmodernism: A Reader* ed. Thomas Docherty (Hertfordshire: Harvester Wheatsheaf, 1993), 50.

a Nietzschean understanding of the death or absence of God, which is affirmed, according to Foucault, 'as the end of man (that narrow, imperceptible displacement, that recession in the form of identity, which are the reasons why man's finitude has become his end.'[5] Having killed God, Foucault asserts that man has also killed himself and that in the death of the human identity, a ground (or absence) is made available from which the posthuman subject emerges.[6]

According to philosopher of technology Andrew Feenberg:

> The posthumanists argue that technology should not be seen as something distinct from humans and nature because technology is "coemergent" with the social and natural worlds. Humans, nature and technologies can only be distinguished theoretically because they have been first distinguished through various practices in which all, not merely the humans among them, engage.[7]

For the posthuman, man-machine symbiosis is indicative of the entirety of human cultural and biological evolution, or in other words, man is man's technology. The reciprocal relationship shared between the two cannot be broken without irrevocably destroying either half of the binary. Posthuman ideology is dependent upon the posthuman philosophy of science posited by Bruno Latour. According to Latour, science and technology co-emerge within a historical-communal network of agency (termed ANT, or Actor Network Theory). Latour's neologism, 'technoscience' (and the derived terms technoculture and technonature) indicates a belief in the networked co-emergence of technology which accompanies all other forms of human development. Latour's use of 'technoscience' connotes the inter-connected nature of scientific thinking, which is at one time grounded in all past scientific achievements, made meaningful only in the face of all future scientific interpretations, and made possible by the necessities of technological mediation. In sum, it is a network, and

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[5] Michel Foucault, "The Order of Things: An Archaeology of the Human Sciences," in *Posthumanism* ed. Neil Badmington (New York: Palgrave, 2000), 27.

[6] It is ironic, in light of the connection between postmodern thought and the death of metanarratives, that the posthuman subject emerges as an echo of the metanarrative of human progress and development.

[7] Feenberg, *Transforming Technology,* 28.

> ...the word network indicates that resources are concentrated in a few places – the knots and the nodes – which are connected with one another – the links and the mesh: these connections transform the scattered resources into a net that may seem to extend everywhere.'[8]

Posthumans use and learn technoscience within the binary of technonature and technoculture. The hybridised syntax reveals the underlying hybridity of their interpretation of modern existence, which is at all times and all places, read through the lens of human productive creativity. For the posthuman, culture, nature, science, and religion are all interconnected and co-operatively moulded by the other. Everything, to them, is hybrid.

In the work to follow, it will be shown that information technology serves as the material foundation for the 20th and 21st century posthuman ideology and is partially responsible for the techno-theological worldview to which the surrounding culture adheres.

Posthuman? Postmodern? Or Both?

Norbert Wiener believed that '[t]he thought of every age is reflected in its technique.'[9] If it is true that technology and thought (technique and knowledge), interpret and challenge each other, than it would seem that the mid-to-late 20th century, which has been typified variously as post-modern, post-industrial, late-modern, late-capitalist, or even the so-called 'information age' – a time which has witnessed drastic changes in technological innovation and implementation and is characterised by a general break with the previous dominant culture and aesthetic – would experience as a corollary a change in worldview, epistemology, or (as is the case with posthumanism) subjectivity. I wish to situate the posthuman ideology within the context of a postindustrial economy which itself precipitates the postmodern world as diagnosed by Jean-Francois Lyotard in his *Postmodern Condition.* According to Lyotard, the 'status of knowledge is altered as societies enter what is known as the postindustrial age and cultures enter what is known

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[8] Bruno Latour, *Science in Action: How to Follow Scientists and Engineers Through Society* (Milton Keynes: Open University Press, 1987), 180.

[9] Norbert Wiener, *Cybernetics: Or Control and Communication in the Animal and the Machine* (New York: The Technology Press, 1948), 49.

as the postmodern age,'[10] that is, an age which is stylised as being incredulous towards meta-narratives[11], though the extent to which metanarratives are abandoned altogether, or merely abandoned and then replaced, remains to be seen.[12]

As has been discussed in chapter four, the postindustrial age figured here by Lyotard has been made possible by the 'leading sciences' of cybernetics and informatics.[13] The immediate result of these technologies is, for Lyotard, a challenge to knowledge. A technology which deals in metaphor, symbol, and meaning, risks devaluing knowledge into a principle for production. The postmodern condition is diagnosed by Lyotard as originating in a move away from narrative forms of knowledge – whereby knowledge is validated by its relationship to metanarratives – towards a form of knowledge which is rooted in a technical and mechanistic reading of Newtonian science. In such an epistemology, knowledge is ultimately reducible to economic terms.[14] Ironically, the very positivism which postmodern thought sought to escape, by fleeing away from certain knowledge or foundationalist metanarratives, reappears in the form of a metaphysics of economics. The transcendent may no longer by the source of certainty, but postmodern thought still approaches the certain by way of faith in the economic system which grounds postmodern discourse. The posthuman, as a form of the subjective self within the postmodern world, is a subject who is approached through the rubric of economics and production.

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[10] Jean -François Lyotard, *The Postmodern Condition: A Report on Knowledge* (Manchester: Manchester University Press, 1984), 3.

[11] *Ibid.*, xiv.

[12] One could argue that the eschewal of the metanarrative in the postmodern facilitation of posthuman thought represents a shift in the style or content of the metanarrative of personhood, rather than the absolute abandonment of personhood as an overarching cultural category.

[13] *Ibid.*, 3.

[14] It is important to note the difference between Newtonian and post-Newtonian science, in terms of the certainty and predictability of a Newtonian cosmology, vs. the indeterminacy of a quantum universe. In post-Newtonian science, physical certainty is only a perception of one's state within a continuum. Though behaviour appears constant in the frame of the human observer, at macro and micro scales things begin to behave in unexpected and counter-intuitive ways. Despite the apparent mystery associated with 20th century physics, the spectre of scientific positivism and the epistemological certainty which it brings, still haunts certain modes of discourse. As is argued here, the posthuman condition is merely an extension of this.

In the postmodern world, with epistemology made subject to commodity, the individual subject faces dissolution in favour of networked, corporate, bureaucratic, and mechanistic consolidations. Once an entity uniquely endowed with the divine image, or certainty of self-knowledge, or a rational soul; the shape of the subject in pre-modern or modern thought, or in the myths and grand narratives of the West, is no longer typical of the subject within the postmodern world. As is reflected by the posthuman appropriation of postmodernism, the 'I' is no longer the central feature of sociality, but rather it is the outlying fabric of society itself or the network in which my 'I' finds its context, that becomes the locus of meaning and value. Thus Lyotard can say, 'A *self* does not amount to much...each exists in a fabric of relations that is now more complex and mobile than ever before. Young or old, man or woman, rich or poor, a person is always located at "nodal points" of specific communication circuits, however tiny these may be.'[15]

Although certain strains of posthuman thought would be consistent with what Lyotard diagnoses as a form of networked and undifferentiated subjectivity, the more dominant response to postmodernism in posthuman writing appears quite contrary to Lyotard's reading of subjectivity in *The Postmodern Condition.* In its reaction to postmodernism, the posthuman subject emerges from the ruins of both pre-modern and modern narratives, attempting to gather from the tattered remnants of narrative a cohesive and composite subjectivity which blends together the knowledge of science and technology with narrative knowledge represented in myth. Posthumanism is a response to the decay of the subject, at the intersection of technology, myth, narrative, and faith. Rather than a tribute to Lyotard's vision of postmodernism, posthumans are a subversive reaction against the unsustainable nihilism of undifferentiated subjectivity, represented by a networked society where the self is in constant decline.

Posthumanism as Postmodern Mythology

Posthumanism (as defined here in terms of human-technology integration) emerges from the postmodern world. Like postmodernity, posthumanism is a result of postindustrial technology and reflects the postindustrial economy's emphasis upon production and efficiency. To be sure, as has

[15] *Ibid.*, 13.

been discussed in chapters four and five, pre-industrial and industrial myths do recount tales of human-like human creations, and many religious themes resonate with the idea of human perfection (the Christian doctrine of the resurrection of the body, for example). However, the use of information technologies, within posthuman discourse, as the technological means by which this myth is vocalised, is a unique 20th and 21st century phenomenon. Quite contrary to the drive within postmodern philosophy to to abandon myth and metanarrative, the posthuman is very much dependent upon the myths which are told about idealised forms of technologies. Such myths, like any human myth, give narrative to the human desire to transgress a given boundary. The archetypal myth of technology is that of Prometheus, the son of the Titans and friend to humanity, who gave to humanity the gift of fire and heavenly knowledge of diverse crafts and technologies. His generosity cost him the favour of Zeus, who reciprocated the Promethean gift by punishing man with the Pandora's Box, and by chaining Prometheus to a mountain where his liver was to be perpetually eaten by vultures. Zeus' anger stems from his own fear that humanity, with technologies derived from the realm of the gods, would be able to cross over into the realm of the Gods, exhibiting control over nature. The myth tells us of how technology allows for a crossing-over of boundaries, from the realm of the human to the realm reserved for the activity of the divine.

Myths about technology allow us to explore what is perceived to be the innate limits of human creativity. Whether it be the myths which are reflected in science fiction, those applied within theory and cyborg-feminism, or those created by speculative science; technological myths illustrate the ruin of sacred truths, revealing through the imagination, scientific and technological possibilities which science and technology would outright decry as impossible. Myths allow us to explore the narratives which technologies give rise to.

The myth of the posthuman describes a fictive being that is made possible by its encounter with technology. The stories about posthumans, and the use of posthuman imagery within philosophy and speculative science, tells us less about the actual technologies which are used to facilitate the emergence of the posthuman, than do they serve to re-narrate the human subject's place within a technological world. Postmodernism might be correct in arguing that metanarratives do not constitute a path to knowledge; yet, when metanarratives are expressed through myth and story

they may very well point the way to the truth. Knowledge, it can be said, is derived from our observations of the natural world. We may learn from observation that different layers of sediment correlate to different periods in geological history, but this observation only becomes truthful when it is recast in the form of story. The posthuman, as the archetypal postmodern subject, represents a postmodern search for truth about human subjectivity, destiny, and the meaning of life, in the context of a world where epistemology is construed in terms of productivity and economics. The knowledge of the technological world where the posthuman is created is insufficient in describing the truth of the human condition which the image of the posthuman is used to critique. We can find knowledge through the material sciences, but this knowledge only becomes truth when it is cast in the form of a story and myth.

Theological Considerations: Authentic and Inauthentic Mythic Discourse

How then do the myths which arise from technological narratives differ from the myths which operate within theology? This question brings us back to similar methodological issues which were addressed in the introduction of this thesis, regarding what differentiates an authentic and an inauthentic theological model. An authentic theological model was described as a model which pointed beyond itself to an unconditioned absolute, whereas an inauthentic model was one which pointed to finite realities as the succour for existential need. An example of this distinction can be illustrated by contrasting the Christian myth of heaven with the posthuman myth of life-extension (a topic to be explored more fully in chapter eight).

The myth of Heaven, as the place where the dead in Christ live with Christ in eternity, functions as the illative of the doctrine of justification by giving narration to the hope that immanent justification (symbolised by either conversion or baptism) effects a transcendent and eschatological end. Though this myth is experienced in word and sacrament, it is only partially realised through sacramental enactment, thus leaving its fulfilment outside of the horizon certain knowledge. Technological myths are also illative of existential hopes. Every time a new technology is regarded as being revolutionary, life-changing, or holding the keys to a better tomorrow, it reveals its mythological heritage as the inference of a universal human hope for something which is beyond the present. Rather than having theological justification, such

mythologies find their ground in scientific validation. A scientific or technological mythology is a system of beliefs which can be explained through precise technical language and so be qualified and quantified and thereby controlled. In contrast, a theological myth, though often reflected in malleable forms such as art, film, literature, architecture, liturgy and dogma, only functions authentically by the complete absence of its object. Unlike technological myths, there is no claim on behalf of an authentic theology that these myths can be fully realised within the immanent sphere. At best, Christian theological hopes are eschatological in their construction, in as much as they reflect a proleptic reading of the present through the lens of the eschaton, as informed by the symbolic and pneumatological constitution of the church.[16]

Posthuman thought seeks to posit a solution to the problem of human finitude, whether the solution to finitude is described in terms of a reversal of social inequalities viz. the hope for a utopia, or more grandly in terms of a victory over death and decay viz. the hope for immortality. Hope in the posthuman future is hope in human ability to procure technologically mediated salvation which results in freedom from human, and cosmic, iniquity. Ironically, although technologies are envisioned within posthumanism as being capable of liberating humans from the aforementioned existential dilemmas; the resulting transformation which these technologies are described as incurring problematises the very humanity which sought liberation in the first instance. If technology is created in such a way as to serve base existential needs, what kind of human – or more specifically what kind of subject – exists within posthuman thinking?

To address such questions we will engage the different answers that are provided by two types of posthuman discourse. The first set of answers, offered through science fiction novels and films, engages with posthuman imagery in order to critique our present use of technology. The second set of answers comes through posthuman speculative science, which approaches the posthuman not as myth but as a hoped for reality which exudes the potential for human becoming. Science fiction narratives are based in the mythological world which arises from the use and development of technology though, as will be illustrated, the technology depicted in either fiction or theory does

[16] Gordon Fee, *God's Empowering Presence* (Hendrickson, 1994), 846.

not necessarily need to be anchored to anything which is remotely technological. By breaking from reality and choosing to use technology analogically or anagogically, rather than illustratively, fiction shows its true intentions in using technologies as narrative and ideological devices which can explore the deeply religious questions of human identity and sociality. Indeed, despite the name, posthuman fiction and film actually promote very humane and humanist ends in their imaginings. This is in contrast to posthuman speculative science which, as will be discussed in chapter eight, conveys an almost anti-human attitude in its speculations.[17]

Theological Consideration: Being or Becoming

An additional theological consideration is the emphasis which posthumanism places on becoming over being. The posthuman ethos is less concerned with the present state of human being than with the destiny of future humanity in terms of posthuman potential. If humanity is nothing but latent potential which will eventually become actualised in a future context, then the present state of humanity only receives its value as a point of transition along the way to the future. An analogue for the posthuman preference for becoming can be found in Christian theology, which likewise tends to emphasise becoming over being. For example, in the works of both Teilhard de Chardin and Wolfhart Pannenberg, it is the future state of the universe, either described in terms of the omega point[18] or the future Kingdom of God[19] which functions as both end and ground of human being and gives impetuous to human action in the present. Moreover, just as the posthuman connotes the perfection of the human, so too does the Christian doctrine of the incarnation or the resurrection of the body, speak to the metamorphic transformation of human flesh into a divinely fashioned posthumanity. How does such a theological posthumanism differ from the secular posthumanism of IT culture? Whereas a secular posthumanism may regard the present as merely a stepping stone on the way to a future destiny, Christian eschatology sees the present as an expression of an already accomplished future reality. For Pannenberg, in particular, the present is

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[17] Susan Sontag, 'Imagination of Disaster' in *Against interpretation, and other essays*, (New York: Farrar, Strauss & Giroux, 1967), 13-23.

[18] Pierre Teilhard de Chardin, *The Future of Man* (New York: Harpers, 1969).

[19] Wolfhart Pannenberg, *Theology and the Kingdom of God* (Philadelphia: Westminster Press, 1969).

not potentiality but more accurately described as plenipotentiary, inasmuch as the present Kingdom of God reflects a reality that is fully invested with the power and the authority of the completed eschaton.

In contrast to a futurological secular posthuman subjectivity (where being is subordinate to becoming), a Christian posthuman subjectivity is undeniably eschatological, inasmuch as 'being' contains both the being of the present as well as eschatological becoming. The present takes part in and receives identity from a future that is both immanent and transcendent.[20] Though one could argue that the Christian doctrine of the resurrection of the dead does speak to a form of posthuman reality, it is a reality that is already experienced in the present, evidenced by the bodily resurrection of Jesus Christ himself. Yet, in keeping with the rubric for an authentic theological model, the Christian posthuman hope for a resurrected body is primarily creedal in its affirmation and is not expected to be accomplished by a means other than a radical breaking through of divine activity. Christian posthumanism affirms present humanity and hopes for a transcendent consummation of human destiny, whereas secular posthumanism denigrates the present in the hope for an immanently realisable technological self-actualisation.

Theological Consideration: The Image of God

Inasmuch as the incarnation of Christ and the resurrection of the body relate to fundamental issues pertaining to the Christian Doctrine of Humanity, it would appear that the most obvious impingement of religion by posthuman discourse would be the challenge of a posthuman identity to the Christian doctrine of creation in the image of God. In contrast to the co-emergent nature of the posthuman's origins, the Judeo-Christian creation myth frames the origins of humanity within the context of direct Divine activity. God's creative word breathes humanity into existence, making Man and Woman a living soul, created in the Divine image and likeness (see: Genesis 1.26-28; 9.6). Though not to be taken as an excuse for certainty – either as an explanatory sign of unmediated divine origins (e.g. Creation 'Science') or as a warrant for causality (e.g. Intelligent

[20] Wolfhart Pannenberg, *What Is Man? Contemporary Anthropology in Theological Perspective*, trans. Duane A. Priebe (Philadelphia: Fortress Press, 1970), 44, 76-77; Fee, *God's Empowering Presence,* 876ff.

Design) – when taken as myth,[21] the symbol of the Genesis creation story can serve as a foundation, rather than an origin. This foundation can be a locus of meaning for those willing to approach the myth in the humility of faith, even though this myth can be a confounding stumbling block for those approaching in the hubris of certainty.

The Christian myth of creation gives rise to an image of humanity that is described in terms of a relationship of dependence. Humans exist underneath a divine creator who gives to the created an identity of reflection.[22] This reflection signals the need which the created has for the creator as the bearer of life and meaning. In the New Testament, the theme of the image of God is echoed in the words of Jesus who emphasised the intrinsic importance of human life in the eyes of God (e.g. Matthew 6.2; 12.12). In the writings of St. Paul, the image of God is explicitly referred to with reference to Jesus, who Paul describes as possessing the fullness of God's image (Philippians 2.6; 2 Corinthians 4.4; Colossians 1.15). For Paul, salvation in Christ is tantamount to the restoration of the broken image in humanity (Romans 5.12-21), which is made complete by Christ's redemptive work (Romans 8.29).

In contrast to what is admittedly vague and scant scriptural reference for the *imago Dei*, the doctrine's historical developments within the Church have been robust. In patristic theology, for example, Tertullian refers to the image with regards to its regeneration at baptism[23] and in Origen the image is understood to be the source of human dignity.[24] For reformers such as Calvin, the doctrine of the *imago Dei* was used to defend the immortality of the human soul[25] and for Luther it was employed to describe Adam's innate ability to commune with God.[26] In contemporary theological discourse as well, creation in the image of God has continued to be a hallmark of the Doctrine of Humanity. Pannenberg goes to great lengths to discuss the historical developments of

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[21] Paul Ricoeur, *Symoblism of Evil*, trans. Emerson Buchanan (Boston: Beacon Press, 1967), 350-1.

[22] Paul Ricoeur, "Thinking Creation," in *Thinking Biblically: Exegetical and Hermeneutical Studies* (Chicago: University of Chicago Press, 1998), 52.

[23] Tertullian, *On Baptism,* 5

[24] Origen, *de Principiis* III.vi.1

[25] Calvin, *Institutes of the Christian Religion,* 1.XV.3

[26] Luther, *The Creation: A commentary on the first five chapters of the book of Genesis,* **??**

the doctrine and concludes by reading the idea of creation in the image of God through the lens of J. G. Herder and Max Scheler's philosophical anthropologies, whereby the image of God is equated with self-transcendence or 'openness to the world'.[27] Although Tillich does not give as extensive a treatment to the doctrine, he employs the image symbolically to indicate the ontological wholeness of humanity.[28]

Though these disparate voices do vary with respect to the emphases which they place on what precisely constitutes the nature and affect of the image of God, it is clear that in Christian theology the doctrine universally implies the unique activity of the Divine in the creation, sustenance and restoration of humanity. Indeed, perhaps even more significant to Christian theology than a belief in the creation of humanity in the image of God, is the notion of divine restoration of the broken image in terms of soteriology. For Christian theological anthropology, a discussion of what constitutes humanity is never far away from a discussion of human sin, and thereby the redemption of sin in terms of Divine grace.[29] Otto Weber's assertion that 'sin is as comprehensive as the image of God,'[30] implies that an understanding of the nature of the Divine image within humanity requires a complementary understanding of the nature and affect of sin, the propensity to sin, and ultimately redemption from sin.[31]

The posthuman understanding of personhood is devoid of any notion of divine creation or any hope for divine grace. Though posthuman speculative science does take an active interest in the nature of finitude with regards to the eventual death of the Sun or collapse of the universe,

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[27] Wolfhart Pannenberg, *Anthropology in Theological Perspective*, trans. Matthew J. O'Connell (Philadelphia, Pennsylvania: The Westminster Press, 1985), 43-78.

[28] Paul Tillich, *Systematic Theology*, 3 vols., vol. 1 (Digswell Place: James Nisbet & Co. Ltd., 1964), 286-89.

[29] The damage suffered to the divine image in humanity is of varying severity, ranging from loss to damage to obstruction, depending on one's theological persuasion. For a discussion of the effects of sin on the image of God, see the discussion of hamartiology in: Otto Weber, *Foundations of Dogmatics*, trans. Darrell L. Guder, vol. 1 (Grand Rapids: Eerdmans, 1981), 580-628. Apart from inklings of the Pelegian heresy, the restoration of this image is generally regarded to be only accomplished through the activity of Divine grace.

[30] Weber, *Foundations of Dogmatics*, 592.

[31] *Ibid.*, 581.

posthumanism understands the fallibility of the cosmos as an opportunity for perfectibility, rather than as a sign of some intrinsic deficiency which requires remediation or redemption from out with the cosmos. Finitude, weakness, or general human lack are not read against a backdrop of mythological prelapsarian perfection, but are rather viewed as imperfections which given the right technological solution can be remedied without any appeal to Grace. Though the posthuman does appear to challenge traditional Christian doctrines of humanity, I argue that the primary point of departure between a posthuman techno-theology and a kerygmatic theology of technology is the dependence of the latter upon the promises or being of God in contrast to the belief of the former in the sufficiency and efficacy of human-technological co-emergence. Accordingly, technology seen as the path to authentic humanity/post-humanity becomes, in the context of posthuman discourse, a means of conveying ultimate concern.

Conclusion

As has been argued throughout this thesis, the culture surrounding information technology offers an inauthentic theological model. Its ability to facilitate hope, give purpose to existence, and point to victory over the finite, is no more clearly demonstrated than in the posthuman thinking of advanced and theoretical IT. The speculative scientists to be noted in chapter eight hope for a posthuman future and develop posthuman technologies by weaving together fiction, fact, and faith to form a techno-theological eschatology which frames the fulfilment of human cultural (memetic) evolution in terms of human-technology co-emergence. This functionally (or perhaps analogically) theological language emerges from the culture surrounding information technology and will be judged categorically deficient in contrast to Christian kerygmatic theology. There is, in techno-theology, no means of establishing the good, no understanding of transcendence, and no room for a category of a truly contingent hope.

The purpose of the exhaustive technical, cultural and literary survey in this section is to establish my thesis that the contemporary culture surrounding information technology seeks to promote an essentialist and substantive philosophy of technology which encourages a form of cybernetic totalism, wherein cybernetics is interpreted as the principal foundation for human being and becoming. In so doing, the culture surrounding information technology relies upon an

inauthentic theological model which offers human technical ability as the solution to ultimate concerns regarding human finitude.

Chapter 7: The Posthuman imagination – Science Fiction, Critical Theory and Cyborg-Feminism

As noted above, approaches to information technology vary from the realist (chapter four) and the idealist (chapter five), to the imagined (chapter seven) and the speculative (chapter eight). The realist-idealist approach considers (in varying degrees) the role which actual technologies play within the physical world. Yet as chapter five addresses, neither exclusive realism nor unbounded idealism can sufficiently address the full import of technology, which exceeds the effects of material artefacts and encompasses the affect of technology within the cultural sphere. The cultural appropriation of technology, including the mythic world which technologies evince, is the topic of this section of the thesis. As argued for in chapter six, IT culture has facilitated the myth of the posthuman. Posthumans are beings who emerge from the stories that are told about information technology. In science fiction, these stories are approached imaginatively or symbolically, whereas in speculative science (chapter eight), these myths are treated as bearers of promise. The imagination of science fiction, in contrast to the role of speculation in speculative science, allows the stories told about technology to encourage critical reflection upon contemporary practices with technology.

Science fiction serves as a source of language and inspiration for the development of IT culture in general, and posthumanism in particular. Donna Haraway's 'Cyborg Manifesto' begins with a tribute to science fiction writing and continues throughout the text to refer to the genre for both content and terminology; a practice also found in Baudrillard.[1] Likewise, Ray Kurzweil, Han Moravec, and Bill Joy – key figures in late 20th century posthuman speculative science – have all commented on the important role played by science fiction in their understanding of future

[1] Donna Haraway, "A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century," in *Simians, Cyborgs and Women: The Reinvention of Nature* (New York: Routledge, 1991), 180. For the connection with Bauldriard, see: Istvan Csicsery-Ronay, Jr., 'The SF of Theory: Baudrillard and Haraway', *Science-Fiction Studies,* 18.3 (1991), 389 in Neil Badmington, ed., *Posthumanism, Readers in Cultural Criticism* (New York: Palgrave, 2000), 8.

posthuman technologies.[2] Noreen Herzfeld and Anne Foerst, mentioned in chapter five with regards to their work on AI and theology, utilise specific science-fiction imagery in the service of their theses: Herzfeld refers to AI characters in films such as *Star Wars* and *2001: a Space Odyssey*[3] and Foerst discusses the influence of science fiction on the creation of Cog, the embodied AI entity which she studied at MIT.[4] Moreover, Graham Ward and Elaine Graham also make avail of science fictional descriptions of technology to argue for the social reach of actual technologies.[5] The ubiquity of science fiction literature and film within culture is the first indication of the general habituation of culture to the technological and scientific ethos.[6]

The posthuman begins its life as a fictional character who reflects the values of a technological culture. Some would argue that the idea of a posthuman finds its earliest representations in the myth of the Golem of Prague or in the late enlightenment fascination with mechanical automata (such as Vaucanson's duck, Kempelen's chess player, or later, Edison's talking doll).[7] In early science fiction film, the idea of an artificial person as posthuman appear as early as Fritz Lang's *Metropolis* (1927), where the masters of Metropolis seek to subvert the workers' liberation movement by replacing their leader Maria with a mechanical doppelganger programmed to do their will. This is preceded even earlier by the stage plays of Karel Čapek, whose *RUR* (Rossum's

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[2] Ray Kurzweil, *The Age of Spiritual Machines* (London: Orion Business Books, 1999).143; Carlo Bertocchini, *Interview Wtih Hans Moravec,*· [cited 12/12/2004]; available from http://www.robotbooks.com/Moravec.htm.; Bill Joy, "Why the Future Doesn't Need Us," *Wired*, 8, no. 04 (2000). Journal Online. Available from http://www.wired.com/wired/archive/8.04/joy.html?pg=1&topic=&topic_set=

[3] Noreen Herzfeld, *In Our Image: Artificial Intelligence and the Human Spirit*, Theology and the Sciences, ed. Kevin J. Sharpe (Minneapolis: Fortress Press, 2002), 53-67.

[4] Anne Foerst, "Embodied AI, Creation and Cog," *Zygon*, 33, no. 3 (1998), 456.

[5] For example, Ward in *Cities of God,* refers to Gibson's *Neuromancer* in his critique of cyberspace. Graham Ward, *Cities of God* (London: Routledge, 2000), 248. And E. Graham uses science fiction consistently throughout her work to describe posthuman mythologies.

[6] See also: Michael Fuller, *Atoms and Icons* (London: Mowbray, 1995), 3.

[7] See: Gaby Wood, *Living Dolls: A Magical History of the Quest for Mechanical Life* (London: Faber and Faber, 2002).

Universal Robot), first published in 1920, was perhaps the earliest 20th century example of fictively represented human-like robotics.

Posthuman science fiction, in contrast to posthuman theory or posthuman speculative science, uses posthuman rhetoric to critically reflect upon how technology is used in the contemporary west. I argue that this offers a theology of technology with a language of ethical critique that lurks behind fiction's often low-culture façade The imagination in science fiction moves from entertainment to the point of ethical challenge by confronting contemporary readers with a picture of true 'otherness' in the form of alternative futures and alternative presents. The technologies and sciences which are at play within science fiction are neither technological nor scientific in the strictest of senses. Actual technologies are governed by the same rules of fallibility and finitude which impact all other facets of existence: technology breaks and will continue to break as long as there is human technology. Yet, this inevitable maxim is not necessarily applicable in the imaginative pallet of the science fiction writer, who is relatively free to explore science and technology apart from any concrete connection to scientific realism.[8] Some, such as science fiction scholar Patricia S. Warrick, would argue that in order for science fiction to convey any ethical import it must keep its stories in conformity with the laws of science. For Warrick, science fiction's fantastical elements are marshalled by the notion that they cannot violate the constraint of' 'scientific sensibility'[9]. Yet I would argue that it is one thing to promote a form of narrative discourse which is scientifically sensible, and quite another to promote a form of narrative discourse which is governed by the limitations of science.[10] Although science fiction stories do

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[8] Although Gene Rodenberry, the father of the *Star Trek* franchise was not necessarily concerned with the facticity of his creation, a generation of research scientists and engineers would attempt to unpack some of *Star Trek's* more uncanny predictions. For example, see: Miguel Alcubierre, "The Warp Drive: Hyper-Fast Travel Within General Relativity," *Classical and Quantum Gravity*, 11, no. 5 (1994). Though this article does not explicitly cite *Star Trek*, the themes discussed are germane to the franchise.

[9] Patricia S. Warrick, *The Cybernetic Imagination of Science Fiction* (London: The MIT Press, 1980), 4.

[10] To accommodate futuristic science fiction which is uncoupled from the constraint of the sciences, Warrick advocates the creation of a second kind of science fictional genre which she calls Futurism. *Ibid.*, 226.

seek to appear 'scientific' by playing upon themes, ideas, theories, inventions and tropes which are the purview of the factual or speculative sciences, I believe that the scientific element of science fiction is only secondary to the fictional and narrative component of such stories. As a genre it is subsumed within the broader category of literary imagination, and not a derivative of either science or technology.

In the imagination of science fiction, science 'tends to slip away, to evade its own evidence or facticity,' making way for the creation of a fictive world where the means-ends system of technological control and scientific reasoning can be challenged and undermined by a concern for the ethical. Though science fiction is 'manifestly about science and scientific possibility,' these elements are only devices used in the service of a narrative that takes into consideration images from technology and science which are often neglected in other forms of literature.[11] In such narratives, the implications of human inventiveness are explored on a stage set in either this world or another. As a result, science fiction problematises dominant assumptions about the human use of science and technology through unfettered fictive imagining.[12]

To find the critique of technology within these stories and myths about technology, we must first demythologise the posthuman, and find the symbol which leads to critique underlying these science fiction myths.[13] For example, rather than viewing the film *Metropolis* as an explanatory myth which points to the real future of human-like robots exerting their own wills over human labourers, we must read such fictive examples as a symbol calling for reflection upon the present state of society's engagement with technology. The science fiction imagination calls for similar ends necessitated by the hermeneutic engagement with technology described in chapter three, namely, the creation of an ethics of technological practice which seeks to illuminate the ambiguity

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[11] J. P. Telotte, *Science Fiction Film*, Genres in American Cinema, ed. Barry Keith Grant (Cambridge: Cambridge University Press, 2001), 3.

[12] Theology and religion have only occasionally engaged with the topic of the science fiction imagination, at least in contrast to other literary genres. The exceptions to this is: Stephen May, *Stardust and Ashes: Science Fiction in Christian Perspective* (London: SPCK, 1998).

[13] For further discussions of symbol and myth in science fiction and speculative science, see chapter eight.

of technology-use, discover the context of the subject within the technological world, and approach the need and possibility for practical reform in the face of a technological society.

Science fiction, within the context of the culture surrounding information technology, is a form of literary discourse which provides insight into human creativity. According to science fiction writer William Gibson (author of *Neuromancer* and *Mona Lisa Overdrive*), rather than describing the world as it may be in the future, science fiction narratives attempt to 'come to grips with an unthinkable present.'[14] For Gibson, a science fiction 'author's toolkit' allows the author to engage with the 'weirdness' of the present, and to project this present on the backdrop of a fictive future. Likewise, in one of the last interviews granted by Philip K. Dick (author of *Do Androids Dream of Electric Sheep?, Ubik,* and *VALIS*), he describes the role of the science fiction author as one which creates a space for the reader to be made aware of the consequences of science and technology.

> SF presents in fictional form an eccentric view of the normal or a normal view of a world that is not our world. Not all stories set in the future or on other planets are SF...and some SF is set in the past or the present (time-travel or alternate world stories). It is not mimetic of the real world. Central to SF is the idea of dynamism. Events evolve out of an idea impacting on living creatures and their society. The idea must always be a novelty. This is the core issue of SF, even bad SF...Good SF tells a reader something he does not know about a possible world.[15]

In science fiction, these imagined possible worlds lay bare the reader's unrealised anxieties about the present, by tapping into concerns about the limitations and consequences of science and technology. Despite its fantastical language, far-fetched plot-lines, and gadget-ridden scenarios, the genre still retains a point of contact with 'reality' by maintaining an interest in ethics and praxis. This patently ethical concern is contrasted with the nature of its twin-genre 'fantasy'. According to Dick:

> Science-fiction involves a suspension of disbelief which is different than that involved with fantasy. In fantasy, you never go back to believing that there are trolls, unicorns, witches,

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[14] William Gibson, *An Interview With William Gibson,*·[cited 18/03/2004]; available from http://www.butseriously.com/gibson.htm.

[15] Philip K. Dick and translated by Sylvie Laine, "Philip K. Dick Et La Philosophie: Une Courte Interview," *Yellow Submarine* 41, no. September (1986).

> and so on. But in science-fiction, you read it, and it's not true now, but there are things which are not true now which are going to be someday. Everybody knows that! And this creates a very strange feeling in a certain kind of person -- a feeling that he is reading about reality, but he is disjointed from it only in temporal terms. It's like all science-fiction occurs in alternate future universes, so it could actually happen someday.[16]

Yet, if science fiction is neither intrinsically married to real-science, real-technology nor the real-world of the present; how truly effective can it be in offering a cultural critique? As stated above, science fiction serves as a source of imaginative critique to a culture that is dominated by science and technology. To retain its critical edge, science fiction must be acquainted with the contemporary scientific culture, though not subordinate to science. It must be capable of exploring science and technology's social, political, philosophical and religious condition, but it must do so with the play of fiction rather than the certainty of science. The critical potential that lies at the heart of science fiction literature (and film) is less related to its ability to create an authentically speculative future than to its ability to 'subvert established values'.[17] It does this by presenting an uncanny alternative world which problematises the dominant modes of being in the present world.[18] In this sense, it shares more broadly with the ability of the poetic and literary imagination to call one into action, by the creation of literary world. According to Ricoeur:

> Through fiction and poetry new possibilities of being-in-the-world are opened up within everyday reality. Fiction and poetry intend being, but not through the modality of givenness, but rather through the modality of possibility. And in this way everyday reality is metamorphosed by means of what we would call the imaginative variations that literature works on the real.[19]

In terms of the posthuman application of information technologies, science fiction reveals cultural anxieties regarding anti-humanist technologies by providing a story which subverts the tendency

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[16] Philip K. Dick and Interviewer Arthur Byron Cover, "Philip K. Dick in Vertex Interviews," *Vertex* 1, no. 6 (1974).

[17] See the pitfalls of speculation in contrast to imagination in the following chapter.

[18] Damien Broderick, *Reading By Starlight* (New York: Routledge, 1995), 54

[19] Paul Ricoeur, "The Study of Religion," in *Figuring The Sacred: Religion, Narrative, and Imagination* ed. Mark I. Wallace (Minneapolis: Fortress Press, 1995), 43.

towards a blind-faith in technology. In the fictional approach to science and technology a fuller expression of the lifeworld is made possible which illustrates to the reader that, 'my surrounding world is more than what the scientist calls nature...scientific objectivity is itself subordinated to the common elaboration of a common cultural world.'[20]

Below, two paradigmatic posthuman science fiction novels will be briefly discussed in support of this thesis. Both novels take place in a parallel world which is marginally ahead in time. Technology in both novels is explored in terms of the subjective self, making the principal concern of either novel the place of the self in the context of the posthumanising potential of information technology. Science fiction both critiques and prefigures the posthuman sentiment described later in speculative science. It serves to explore the negative implications of a posthuman yearning, showing the reader the value of the present-human by exploring the ends of one's social-technological imaginations.

Representations of the Posthuman in Literature

Do Androids Dream of Electric Sheep? – Posthuman sociality and the triumph of empathy

Philip K. Dick (1928-1982) was one of the foremost writers of science fiction literature in the mid-20th century.[21] Though Dick authored nearly 50 novels and approximately 121 short stories, it has only been in the last 20 years – due in no small part to the many recent film adaptations of his work[22]– that he has (posthumously) received broad sweeping critical acclaim. Dick's science

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[20] Paul Ricoeur, *Husserl: an Analysis of His Phenomenology*, Northwestern University studies in Phenomenology & Existential Philosophy, ed. John Wild (Evanston: Northwestern University Press, 1967), 70-1.

[21] See: Patricia S. Warrick, *Mind in Motion: The Fiction of Philip K. Dick* (Edwardsville: Southern Illinois University Press, 1987).

[22] Most notably, Philip K. Dick's *Do Androids Dream of Electric Sheep?* was adapted by Ridley Scott for the film *Blade Runner* (1982). Six other feature films have been based on Dick's fiction, including *Total Recall* (1990) – based on the story 'We Can Remember It For You Wholesale', *Confessions d'un Barjo* (1992) – based on the novel, *Confessions of a Crap Artist, The Minority Report* (2002) – based on the story 'Minority Report', *Impostor* (2002) – based on the story, 'Impostor', and *Paycheck* (2003) – based on the short story 'Paycheck'. At the time of the writing of this thesis, the

fiction is uniquely human-centred when compared to the more technologically-driven tone of other hard sci-fi authors. In technology-driven hard sci-fi, such as Greg Bear's *Eon*, the technical construction of the future world precedes the development of either character or plot. In work like Bear's, the author wishes to construct worlds which are drawn primarily from technical reasoning. The mechanisms, devices, and astronomical references eclipse the main characters of such books, sacrificing the quality of their fiction for the sake of their science. In contrast, according to one commentator, 'Dick tends to write more about inner space than outer space. His characters come before his machines.'[23]

Dick's work combined metaphysical strands gathered from literature, philosophy and theology, to create a cohesive sci-fi world which portrayed a vision of humanity anchored in community and founded in the universality of human empathy. Dick's characters love, hate, worship, philosophise, theologise, learn, and engage in complex social, familial and economic situations.[24] If his future includes a vision of a posthuman world, he has not forgotten to maintain traces of present-humanity in the process.[25] Rather than depending upon stylisations of human interactions with actual technologies, Dick's work cuts to the quick of the human-technology relationship by characterising human identity in confrontation with human creativity.

The posthuman themes covered in his body of work explore the place of the human subject set within a world saturated by technology. Persons for Dick are constantly moved towards the liminal space where the boundary between human and posthuman is ever confused. This topic is explored

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novel *A Scanner Darkly* is in post-production for release in cinemas in 2005 and plans are under way for an adaptation of the short story 'Next' in 2006.

[23] George Cain and Dana Longo. Philip K. Dick: Confessions Of A SF Artist. *Denver Clarion*, October 23, 1980

[24] Philip K. Dick and Interviewer Frank C. Bertrand, "An Interview With Philip K. Dick. (1982)," *For Dickheads Only* 5 (1994), 26-7.

[25] The subtlety of Dick's philosophy attests to the many sources which under gird his work. Dick admitted to being greatly influenced by the work of 'Yeats and Wordsworth and...Goethe', and his early philosophical interests included 'philosophers such as Spinoza and Leibniz and Plotinus -- the last influencing [him] greatly.' He has also has indicated a keen interest in process thought, 'particularly Alfred North Whitehead and Bergson. *Ibid.*

through depictions of mutations caused by pollution (the autistic Manfred in *Martian Time-Slip*), the effects of psychotropic pharmacology in relationship to the deterioration of self and community (the users of CAN-D in *The Three Stigmata of Palmer Eldritch*), or the blurring of personal identity through technologies of life-extension (Joe Chip in *UBIK*). In Dick's interpretation of a posthuman future, the current experience of humanity is open to alteration from either evolutionary forces (humans naturally endowed with 'supernatural' powers or capacities – monsters, mutants, freaks, and the like) or through contact with technology (humans technologically augmented – androids, cyborgs, computer-minds, etc.). For Dick, both the 'natural' posthuman and the 'technological' posthuman represent points of significant departure from human identity as it stands in its current evolutionary and technological manifestation.

Dick's most well-known novel, *Do Androids Dream of Electric Sheep?* (published originally in 1968, and adapted in 1982 for Riddley Scott's film *Blade Runner*), explores posthuman themes by juxtaposing human and posthuman subjectivities through a depiction of human-android encounters. Androids in Dick's work are the height of informational and biological technologies; the merger of human characteristics and form with artificial (post-human) intelligence and strength.

The novel is set in the post-apocalyptic future of mid-21st century North America. By the year 2021, the fallout of the great World War has killed off millions of humans and countless numbers of other life forms on Earth, forcing many species into extinction and sending humanity into mass-exodus from the planet. Those who remain struggle to maintain genetic purity in light of the mutating effects of the damaged planet's environment. The posthuman element of this novel emerges in light of extant humanity's attempt to carve out meaning, purpose and value in the bleakness of post-apocalyptic Earth. In a dieing world ravaged by environmental catastrophe, humanity seeks to maintain a connection to the pre-apocalyptic past by clinging to chimerical fragments of nature and religion. The characters in *Do Androids Dream of Electric Sheep?* turn to their technologies to find release from the internal and external wasting away that is endemic to their world.

In the passage below, Dick's protagonist, the bounty-hunter Rick Deckard is alone in a seedy hotel room with an attractive female android called Rachael Rosen, on loan from the Nexus

Corporation, the world's largest purveyor of human-like androids. The two are working together to find a group of androids, of the same type as Rachel, who have escaped to Earth from the Martian colonies. At this moment, Deckard's characteristically hard exterior and uncomplicated approach to androids is confused by an erotic encounter:

> I wonder what it's like to kiss an android, he said to himself. Leaning forward an inch he kissed her dry lips. No reaction followed; Rachael remained impassive. As if unaffected. And yet he sensed otherwise. Or perhaps it was just wishful thinking....
>
> "We *are* machines, stamped out like bottle caps. It's an illusion that I-I personally exist – really exist. I'm just representative of a type." She shuddered....
>
> He walked over to the bed.
>
> Squirming about, Rachel managed to roll over at last onto her stomach, face buried in the white lower sheet. "This is a clean, noble, virgin type of bed," she stated. "Only clean, noble girls who-" She pondered. "Androids can't bear children," she said then. "Is this a loss?"
>
> He finished undressing her. Exposed her pale, cold loins.
>
> "Is it a loss?" Rachael repeated. "I don't really; I have no way to tell. How does it feel to have a child? How does it feel to be born, for that matter? We're not born; we; don't grow up; instead of dying from illness or old age, we wear out like ants...Chitinous reflex-machines who aren't really alive." She twisted her head to one side, said loudly, "*I'm not alive!* You're not going to bed with a woman. Don't be disappointed; okay? Have you ever made love to an android before?"
>
> "No," he said, taking off his shirt and tie.
>
> "I understand – they tell me – it's convincing if you don't think too much about it. But if you think to much, if you reflect on what you're doing – then you can't go on. For, ahem, physiological reasons."
>
> Bending, he kissed her bare shoulder.
>
> "Thanks, Rick," she said wanly. "Remember, though: don't think about it, just do it. Don't pause and be philosophical, because on a philosophical standpoint, it's dreary. For us both."[26]

One of the ways in which Dick explores the confusion of humanity and posthumanity is by way of Deckard's ambiguously resolved sexual advances towards Rosen. He approaches her, but is unsure if in so doing he feels a genuine reciprocated passion, or merely a projection of his own lust. Is she an object of love, or merely an erotic idol? Prior to his experience with Rosen, Deckard was an uncomplicated man with little misgivings about human-android differentiation. Yet, in the face of an 'other' who is truly uncanny – simultaneously familiar and alien and at best an ontological hybrid – Deckard experiences what for Dick is the true difficulty of technology in connection with subjectivity. In Dick's vision of a posthuman world, man finds the image of himself obfuscated in the face of his empathetic technique.

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[26] Philip K. Dick, *Do Androids Dream of Electric Sheep* (London: Millennium, 1999), 160-1, 3-4.

The scene is written in such a way as to convey the inner-struggle experienced by both characters, as they come to terms with what constitutes personhood and identity in light of human and posthuman experiences of being. Here, the context of sexual familiarity reminds the reader both of the radical alterity of the android, and her homely familiarity to Deckard. Androids in Deckard's world are supposed to be complete objects of otherness, yet Rosen appears human/posthuman by virtue of her sexual allure and social vulnerability. The cultural myth implied in the novel about androids dictates that they are neither capable of empathy nor objects of human love. In this posthuman future, Dick pens a world wherein the ambiguous relationship shared between humans and human technologies is manifested in a binary of loving and loathing. Trying to live in the midst of a dying world, Deckard and his compatriots are ever attempting to uncover or recover some core of true humanity, what in Dick's work is conveyed by a constant striving after (and protection of) empathy. The value which is placed upon empathy thinly masks what is in actuality a desire for self-transcendence.

What Dick calls into question through this text is the extent to which human technology can authentically function as a substitute for actual social/religious/environmental relations. Towards the end of the story, we find what could perhaps be viewed as Dick's own answer to this dilemma. After the conclusion of his assignment to 'retire' the rogue cadre of androids, Deckard returns to his apartment and encounters his wife Iran who has been patiently waiting for him during the course of the story. We last encountered her at the very beginning of the text, where she was described as a moody, weak, drug-addict whose only impact upon Deckard was her constant nagging about both his character and his career. Here at the end, we encounter her playing Penelope to Deckard's Odysseus – patiently waiting for her partner to return from his never-ending odyssey. He sees her and admits:

> "You were right this morning when you said I'm nothing but a crude cop with crude cop hands."
>
> "I don't mean that any more," she said. "I'm just damn glad to have you come back home where you ought to be." She kissed him and that seemed to please him; his face lit up, almost as much as before...
>
> "Do you think I did wrong?" he asked. "What I did today?"
>
> "No."

> "Mercer said it was wrong but I should do it anyhow. Really weird. Sometimes it's better to do something wrong than right."[27]

Dick's conclusion offers consolation to a humanity living within a posthumanising world, in the form of reciprocal *human* (as opposed to posthuman) community. In contrast to Deckard's empty affair with Rachael Rosen, his kiss with his wife Iran serves to fulfil his need for intimacy. Here in the context of home the book concludes by pushing aside the posthuman ambiguities of androids, and fades away with Deckard finding ultimate consolation in human sociality.[28]

Neuromancer – Posthumanism and the truly human.

In *Do Androids Dream of Electric Sheep?,* technologically-mediated posthuman subjectivity was pitted against technology-free human subjectivity as evidenced through the very human experience of empathy felt in the confines of human intimacy. Dick's portrayal of the posthuman as a negative consequence of human technique can be contrasted with the treatment of the posthuman in William Gibson's 1984 novel, *Neuromancer.* Here, in Gibson's posthuman imagination, posthuman technologies not only provide their recipients with much needed survival skills, but through their use and integration within the human subject, human technique is regarded in the novel to be a path towards the fulfilment of human destiny. Yet like *Do Androids Dream of Electric Sheep?, Neuromancer* concludes by dismantling the theory that technology can offer a more enlightened form of humanity, by pitting the perfectibility of the posthuman against the necessary fragmentation of true-humanity.

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[27] *Ibid.,* 242.

[28] My interpretation of Dick's conclusion is not unanimously agreed with. Patricia S. Warrick argues that *Do Androids Dream of Electric Sheep?* is a novel which is principally about exploring the nature of what is really the real: 'Maybe reality is a fake...What are we to believe. What is false appearance and what is true reality? How can we differentiate illusions from reality?...In *Do Androids Dream* the reader is spiralled through so many assertions and negations and negations of negations that at the end of the novel he is uncertain of what Dick would have him believe.' (Warrick, *Mind in Motion,* 129). I think, however, that Warrick's structural exegesis of Dick's novel (evidenced throughout her text, though helpful at finding parallels and ambiguities written within the narrative, misses the simple solution offered by Dick in the end, through the resolve to the homely in Deckard and Iran's relationship.

William Gibson (1948-*pres.*) began publishing science fiction in 1977 with his first story, "Fragments of a Hologram Rose" in *UnEarth,* a short-lived pulp science fiction magazine.[29] Gibson was an American by birth who moved to Vancouver, B.C. in 1972, in protest to the Vietnam War. In light of the intense Asian and particularly Japanese presence in Vancouver at the time, it is not surprising that much of Gibson's early fiction centred on the influence of Japanese culture and technology upon North America. In addition to writing the *Neuromancer* trilogy – comprised of *Neuromancer* (1984), *Count Zero* (1986), and *Mona Lisa Overdrive* (1988) – Gibson also contributed to film and television tales such as *Johnny Mnemonic*[30] and *Max Headroom.*

Gibson's work from the 1980's can be described as some of finest examples of the science fiction sub-genre known as *Cyberpunk.*[31] His *Neuromancer* universe embodies the ethos of cyberpunk fiction; a subgenre of hard science fiction (that is, science fiction which uses technology as a central component of the plot), which emerged at a time when information technology and personal computers were becoming increasingly commonplace at both home and work. Following in the footsteps of the surrealism of William S. Burroughs, the ecstatic-writing of Georges Bataille, and the graphic art of Salvador Dali and Man Ray, the genre of cyberpunk plays upon forms of discourse within the technological and scientific worlds, producing what Scott Bukatman calls a

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[29] *UnEarth* published 8 issues from the winter of 1977 to the winter of 1979.

[30] Directed by Robert Longo, 1995.

[31] The term originates in Bruce Bethke's 1983 story 'Cyberpunk', published in the magazine, *Amazing Stories*. The moniker, cyberpunk, is not without its detractors, and it is by no means universally regarded as a genuine subgenre. Many of the themes referred to above, as being germane to cyberpunk, are readily found in earlier science fiction novels. Cyberpunk gets its name because it relies heavily upon a popularised understanding of cybernetics and because its main characters exhibit a general disregard for the systems of control which dominate their worlds by behaving, speaking, and dressing in a manner consistent with the late 70's and early 80's punk culture out from which this genre emerged. As a literary form, it is centrally concerned with the 'rhetorical production of a complex imbrications between the human subject and the electronically defined realities of the Dataist Era' Scott Bukatman, "Postcards From the Posthuman Solar System," in *Posthumanism* ed. Neil Badmington (New York: Palgrave, 2000), 103.

'highly poeticised, dreamlike liberation.'[32] The world which was promoted by science and technology to be *the actual* world is taken by cyberpunk fiction and subverted to reveal its metaphorical weight. The genre takes full advantage of the language of contemporary information technology and situates its stories within a parallel world which exists alongside a version of the present or near-present. This world, like our own, is seen as being dominated by vast and powerful systems (governments, corporations, artificial intelligences). Antagonists in such novels are either the systems themselves or those individuals who have given over their own volition to the collective purposes of the system. Protagonists are those individuals who wield with unnatural proclivity an ability to master the information technologies which, at the end of the day, underlie the dominant systems of the story's fictive world. A true genre-forming novel, *Neuromancer* is perhaps the finest example of both postmodern and posthuman science fiction produced within the cyberpunk subgenre.

The novel follows the story of Case, a master-computer hacker who has been hired by a mysterious entity to hack into and destroy a sophisticated artificial intelligence system. Computer hacking in *Neuromancer* is described in terms later popularised in the film trilogy, *The Matrix*. Rather than sitting at a terminal and typing his code, Case practices his craft within the multi-dimensional space of 'cyberspace', where his consciousness is uploaded to the computer network and his embodiment is re-instantiated on the digital plane. Indeed, in Gibson's work subjectivity is ever emptied into the instrumental world, as minds, bodies, and personalities are in a constant state of flux. Posthuman existence is typified by a stark disregard for conventional understandings of boundaries between human bodies and human technologies.

Although posthuman augmentation of the body is a significant feature of Gibson's cyberpunk novel, it is technology's ability to confuse sociality which is the most pronounced feature of the posthuman technologies in *Neuromancer*. By plugging into cyberspace, Case, can live passively

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[32] *Ibid.*, 108-9 Bukatman continues saying that, 'cyberpunk constitutes a discourse within which many concerns and techniques of surrealism again become relevant – a techno-surrealist production of new flesh, terminal flesh.'

within the body of his love-interest Molly, seeing what she sees, hearing what she hears, feeling what she feels:

> The abrupt jolt into other flesh. Matrix gone, a wave of sound and color...She was moving through a crowded street, past stalls vending discount software, prices felt penned on sheets of plastic, fragments of music from countless speakers. Smells of urine, free monomers, perfume, patties of frying krill. For few frightened seconds he fought helplessly to control her body. Then he willed himself into passivity, became the passenger behind her eyes...
>
> "How you doing, Case?" He heard the words and felt her form them. She slid a hand into her jacket, a fingertip circling a nipple under warm silk. The sensation made him catch his breath. She laughed. But the link was one-way. He had no way to reply.[33]

This near fulfilment of the biblical commendation that man and woman become 'one flesh'; Case and Molly converge together in one body. Throughout the novel, Case learns to shift his embodiment from the seedy real-world where his 'meat' is forced to live, and splits his time between cyberspace and the so-called real space.

In *Neuromancer,* shifting bodies, the talking dead, and hive mind intelligences all express a general ambiguity about the nature of authentic human subjectivity, in juxtaposition to artificial or posthuman subjectivity. In Gibson, we see characters engaging in computerised simulations so compelling that determining the artifice is all but impossible. As the novel progresses, Case's 'meat' is increasingly neglected as his mind spends more and more time in its new embodiment in cyberspace. Though this is initially depicted by describing the state of his beard, the type of food he does or does not eat, or his choice to use a catheter in order not to soil himself when plugged into the matrix for extended periods of time; towards the end of the novel, the relegation of his body is figured by frequent stints of brain-death, termed 'flat-lining'. Death/life, embodiment/disembodiment/re-embodiment and the subjectivity of *Neuromancer* reveals an underlining fluidity and plasticity within the nature of one's own personality. All of this is facilitated by the human experience of technology.

In *Neuromancer,* we find the ultimate trajectory of the human drive to self-perfection through the use of posthuman technologies. The conclusion introduces the reader to an artificially generated perfect posthuman being who underscores the latent divinity implied within human creativity. Yet the irony is that though the pseudo-divine construct may experience satisfaction in

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[33] William Gibson, *Neuromancer* (New York: Penguin, 1984), 56.

his freed embodiment, humans within cyberspace are always described in the novel as wrestling with the ambiguity that digital re-embodiment carries with it. Whether it is an artificial intelligence which laments its own infinity, or the protagonist's fight to escape false-embodiment within the hive mind; human being is never content to fully embrace a posthuman reality. In *Neuromancer,* to be posthuman is to be un-human, that is, to be truly artificial. Though posthuman technologies hint at immanent improvements in human being, the transcendence which is to be found in the abyss of death (that is, real death), is always elevated over the immanent nature of the posthuman illusions of immortality. Under the posthuman surface is the very human desire for the unknown of the eternal. As will become increasingly clear as this chapter progresses, the irony of the posthuman attempt the thwart death, which is precisely what is at the heart of its mythological and theological significance, is merely a reflection of technological slight of hand. This illusion of the posthuman ethos becomes most concentrated within the world of posthuman science fiction film.

Representations of the Posthuman in Film

Themes relating to posthumans can be traced to the very early history of film (the false Maria in Fritz Lang's *Metropolis,* 1927; Charlie Chaplin as proto-cyborg in the automatic feeding machine of his *Modern Times* 1936; and Gort, the fictional robot in Robert Wise's *The Day the Earth Stood Still*, 1951). Like contemporary posthuman films, the narratives depicted in early cinema – through basic set design and rudimentary special effects – explored the complicated relationships which existed between humans, society and technologies. Yet the spectatorial affect of such early films was severely limited by their capacity for special effects with extant cinematographic technologies. Indeed, it is difficult to see an affinity with posthuman androids who are portrayed as characters cheaply adorned with aluminium siding. Today, posthumans in film are portrayed in an increasingly convincing manner, through the use of advanced representational technologies.

The close knitting of filmic technologies within postmodern science fiction has been considered by many to be the hallmark of the genre. Indeed, 'movies about the future tend to be

about the future of the movies.'[34] The technologies depicted in posthuman science fiction films mimic many of the film technologies that have contributed to their very own representation.[35] These representational technologies move the cinema goer into contact with the posthuman by virtue of their ability to produce special affect through special effects. Advanced cinematographic technologies in film give flight to the mythic possibilities and consequences of a science fiction narrative by reaching beyond the actual limitations of scientific possibility. In American cinema, in particular, the use of new electronic technologies in the whole spectrum of the industry – inclusive of content, production, distribution and exhibition – has made such technologies a means of articulating a new and highly technologised experience of what according to Sobchack Martin Heidegger would call "being-in-the-world".[36]

Contemporary postmodern science fiction films can be defined as films which make special use of technology in their productions, convey a pastiche attitude towards genre, and use technology to critique technology's ambiguous use within culture. Such films alter the viewer's perception of space, time, and depth, and thereby problematise one's interpretation of the now, the here, and the self. This form of self-estrangement is most pronounced with regards to the cinematic portrayal of otherness, through the representation of artificial forms of sentient life such as those typified by the posthuman

The posthuman is a particularly apt subject for visual representation because so many of the technologies which are described as the means of creating the posthuman (nuclear energy, nanotechnology, genetic engineering, information technologies) are themselves visually abstracted. Both nanotechnology and genetic engineering deal with objects so infinitesimally small that apart

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[34] Garrett Stewart, "The 'Videology' of Science Fiction," in *Shadows of the Magic Lamp: Fantasy and Science Fiction in Film* ed. George Slusser and Eric S. Rabkin (Carbondale: Southern Illinois University Press, 1985), 159.

[35] IT, in particular, possesses a strangely intertextual role as representing and represented in films such as *Lawnmower Man* (1992), *eXistenZ* (1999) *Matrix* trilogy (1999, 2003, 2003). Here, IT is both the subject of the film, and the means by which the film's subject is visually portrayed.

[36] Vivian Sobchack, *Screening Space: The American Science Fiction Film* (New York: Ungar Publishing Company, 1988), 225.

from visual representation, developing and applying such technologies would be impossible. The converse problem arises in the face of nuclear energy, where the release of energy is so great that it is only through mediation (either in the form of video equipment, protective optics, or instrumentation) that this force can be measured, observed, or recorded. Furthermore, with the advent of graphical user interfaces for personal computers, information technology has become - in the public eye – an industry that is synonymous with video displays and visual abstraction.

Postmodern Science Fiction Film

If posthuman science fiction film is read as a portrayal of the uncanny (*unheimlich*), it would imply that the depiction of posthumanising technologies in such films serves to uncover how the human application of technology reshapes and models the self. Such technologies make strange and unfamiliar oneself *to* oneself through a film's portrayal of robots, androids, and cyborgs. The *Uncanny* – as that which is other and unfamiliar yet terrifyingly recognisable – bespeaks a confusion of subjectivity where themes of the self through the multiplication of personality, signal the collapse of what is the horizon between the subject and the object. The Uncanny in posthuman science fiction forces the reader/viewer to reconsider fundamental assumptions about subjectivity and to question how one understands what is human and what constitutes the human construction of the world.

The portrayal of the posthuman in science fiction film generally falls under the banner of postmodern science fiction. Postmodern science fiction examines the role played by technoscience as both an object of such films and the means by which such films are conveyed to their audiences. Attention to technology within and behind film allows the critic to uncover how technology, as a cultural product of any given historical period, reflects and exposes the concerns and values of that period. Though such products may be heavily stylised and fictionalised through their depiction in film, they retain their ability to facilitate reflection and critique. Technology in science fiction film challenges the viewer's assumptions about what it means to be human in the modern world, and

more specifically, what it means to establish human identity in light of the complex relationship with human technology.[37]

The postmodern penchant of contemporary science fiction is also reflected in the pastiche approach to narrative, genre and spatiality. The non-narrative nature of many science-fiction stories use time-travel to subvert traditional forms of story with a new-postmodern science fictionalised story (*Back to the Future,* 1985, 89, 90; *The Time Machine,* 2002). The trans-spatiality of cyberpunk films such as the *Lawnmower Man* (1992), *eXistenZ* (1999) *Matrix* trilogy (1999, 2003a, 2003b), challenge typical depictions of spatiality by giving explicit form to the non-spatial or fictive spatial nature of 'cyberspace'. Furthermore, the genre's appropriation of another genres' forms and tropes also serves to undermine modernist notions of genre homogeneity. This is depicted by Sobchack as the 'the new depthlessness, the weakened historicity, the new emotional tone, and the new relationship to the "new" (whether technological or biological),' which she says construes the features of a new aesthetic for postmodern science fiction as a reflection of the 'values and logic of late capitalism' [38]

The posthuman comes to us in film to challenge our given assumptions about what it means to be human, to live in the world, and to exist alongside others and alongside technology. Posthuman films call the viewer to actively question his or her passive acceptance of the status quo, and to pursue, through the fictional imagination on screen, new modes of being in the world. For religions of the West, the challenge is to re-interpret traditional ways of describing self-knowledge in light of a changing culture and to challenge cultural modes of self-description, while keeping into consideration the provenience of Divine Grace.

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[37] See: Aylish Wood, *Technoscience in Contemporary American Film: Beyond Science Fiction*, Inside Popular Film, ed. Mark Jancovich and Eric Schaefer (Manchester: Manchester University Press, 2002), 144-5. Yet, however effective a posthuman subjectivity may be at undermining the essentialism of humanist of modernist subjectivities, by capitulating to an idea of magnanimity of the human-machine relationships, asserting that technology is the way in which to see the world, and that technologies are somehow irrevocable forces which steer the ship of humanity, this subjectivity destroys the human at the expense of the technological.

[38] Sobchack, *Screening Space,* 253.

Cyborgs and Fictional Posthumans in Theory and Feminism

Depictions of posthumans in film and fiction have led to the use of such images in critical theory and cyborg-feminist discourse, beginning in the early to mid 1980s and continuing to this day. Principally, the cyborg has served as a symbol for the posthuman subject in posthuman critical theory and cyborg-feminism. A combination of the neologism 'cybernetics' (the study of feedback loops as described in chapter four) and organic organisms; the term 'cyborg' is as much a hybrid as the thing which it signifies. Although a mainstay of science fiction and academic reflection (what Mark Dery calls an academic 'growth industry'[39]), the term cyborg finds its origins in the technical literature surrounding the space-race of the 1960's. Manfred Clynes and Nathan Kline coined the term 'cyborg' in their paper 'Cyborgs and Space' which was an examination of the integration of advanced technologies directly into human physiology. They imagined the cyborg as an entity who could overcome the natural limitations that prohibit humans from engaging in extended space travel[40] Space exploration for Clynes and Kline was a catalyst for a radical shift in how human nature and destiny were to be understood in connection with human technologies. 'Space travel challenges mankind not only technologically but also spiritually, in that it invites man to take an active part in his own evolution.'[41]

In recent film, cyborgs have been represented in two distinct ways. With the advent of the cyborg in film from the mid 1980's to the late 1990's, cyborg characters were represented as muscle-bound action heroes who appeared completely human in form, though their intellect and superhuman strength came from technological body modifications. The cyborgs of this era were portrayed by actors such as Arnold Schwarzenegger and Jean-Claude Van Damme, who themselves were as much a product of the body modification technologies of the 20th century fitness centre, as were their on screen characters products of 21st century cybernetics. Early cyborg films such as *The Terminator* (1984 1991, 2003) and *Cyborg* (1999), *RoboCob* (1987, 1990, 1993),

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[39] Mark Dery, "Cyborg Citizen," *Wired*, 9, no. 5 (2001). Journal Online. Available from http://www.wired.com/wired/archive/9.05/streetcred.html?pg=11

[40] Manfred Clynes and Nathan S. Kline, "Cyborgs in Space," in *The Cyborg Handbook* ed. Chris Hables Gray (New York: Routledge, 1995). Originally published in *Astromatics*, Sept. 1960.

[41] *Ibid.*, 29.

Hardware (1990), and *Eve of Destruction* (1991) play on the idea of the action figure-*as*-cyborg, who through technologically-enabled strength, speed, and heartless calculation embodies the potential dangers portrayed as inherent within human-machine synthesis.

Toward the end of the 1990's, the image of the cyborg underwent a radical transformation, as the tanned, sweaty, muscular killing machines of the late 1980's were replaced by slim and pale computer hackers, who realised their inner-cyborg by jacking into the matrix of cyberspace. Films such as Robert Longo's *Johnny Mnemonic;* Kathryn Bigelow's *Strange Days;* Iain Softley's *Hackers;* Brett Leonard's *Virtuousity,* and Irwin Winkler's *The Net* (all released in 1995); the Wachowski Brothers, *Matrix* trilogy (1999, 2003a, 2003b), and Vincenzo Natali's cult-film *Cypher* (2002) denote the transition from the cyborg body to the cyborg mind, where it is through expanded consciousnesses (and not expanded pectoral muscles) that one embraces the cyborg ethos. Cyberthrillers, influenced by cyber-punk fiction and the economics of the burgeoning dot-com era, moved away from the depiction of the cyborg as a force of disruption in this world to the cyborg as the force of order that is imposed upon the corrupt systems which, though invisible, permeate this world and the next.

Posthuman science fiction films trade on an economy of relations, where body, gender, sex and skin are commodities whose values are determined by their purchase within human and posthuman pathologies. As Scott Bukatman has noted,

> At the intersection of cybernetics and phenomenology, the body already operates as an interface between mind and experience, but in contemporary SF and horror, the body is also narrated as a site of exploration and transfiguration, through which and interface with an electronically-based postmodern experience is inscribed. The body is no longer simply the repository of the soul; it has become a cyborg body, one element in an endless interface of bio-technologies....the computer alone has been figured as a prosthetic extension of the human...as a replacement for the human in a posthuman world.[42]

The posthuman-*as*-cyborg is an image which explores the loss of control in the face of technology. Whether it is the destruction of personal will in the form of a *RoboCop,* the controlling

[42] Bukatman, 'Postcards', 98.

power of the ubiquitous *Matrix*, or the corporate brainwashing depicted so cleverly in *Cypher*; cyberthrillers and the cyborgs that comprise them, grapple with the very postmodern concern that within a complex networked world, personal-will and control are illusions that are quickly dissipating. Through the image of the cyborg, posthuman science fiction films have played an active role in depicting this sentiment, by giving narrative and visualization to the confusion, diffusion, helplessness, hybridization and the loss of certainty endemic to postmodernism.[43] Unlike the cyberthrillers of the 1980's and early 1990's, which played on this instability through the image of the dominating cyborg, the late 1990's cyberthrillers attempt to define life through cybernetic existence, by giving over to the hybrid nature of the networked-self. In this way, the relations of similitude portrayed in such films, which depict cyborgs ranging from the forcefully assimilating Borg Queen of *Star Trek Nemesis,* to the cyborg-esque Morgan Sullivan in *Cypher*, offer the viewer a means of reflecting on their own entanglement within the cybernetic systems of contemporary life.

For Clynes and Kline the cyborg was intended to be an example of how a human/technology hybrid could regulate and optimise its physiological functions to match the needs governed by a given environment. The idea behind the cyborg is the creation of a 'self-regulating man-machine system'[44] which would provide a human living in an inhospitable environment the same kind of self-adjusting balance that proprioceptive sense gives to movement or that the endocrine systems provides to the balance of hormones. 'The Cyborg deliberately incorporates exogenous components extending the self-regulatory control function of the organism in order to adapt it to new environments.'[45]

Within just a few years of its use in technical literature, the term cyborg was appropriated by science-fiction media, (inclusive of literature, television, film). In the late 1980's, the term was yet again re-purposed in feminist scholarship. In both fiction and the academy, the notion of the

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[43] Claudia Springer, "Psycho-Cybernetics in Films of the 1990s," in *Alien Zone II: The Spaces of Science-Fiction Cinema* ed. Annette Kuhn (London: Verso, 1999), 205.

[44] Clyne and Kline, "Cyborgs in Space," 30.

[45] *Ibid.*, 31.

cyborg is used to connote an entity of mixed-ontology, the merger of two different sets of things into the creation of a new sort of being or a new way at looking at being as such. Within critical theory and cyborg-feminism, the cyborg is used as an emblem of the posthuman/postmodern subject and its embedded existence within the physical world.

Though the primary and secondary sources for posthuman theory are exhaustive, I would argue that the archetypal posthuman theorists is Donna Haraway, whose 'Cyborg Manifesto: Science, Technology and Socialist Feminism in the Late Twentieth Century' published originally in 1985, has been used as a springboard by critical theorists and feminists alike to explore the implications of posthuman technologies. Haraway's work responds to the trend in theory and feminism to use the science fiction figure of the interlaced human and machine as an ironic metaphor for current and future gender typologies. The context of her manifesto was admittedly the 'secular-religious, evangelical traditions of United States politics, including the politics of socialist feminism.'[46]

In the 'Manifesto', Haraway steals the term 'cyborg' away from what she sees to be the hands of either the male-dominated technical sciences or the equally male-dominated world of science fiction, and reapplies 'cyborg' as a symbol of the postmodern (if not posthuman) use of the human-technology symbiosis over the limitations of gender stereotypes. According to Haraway:

> The cyborg is a creature in a post-gender world; it has no truck with bisexuality, pre-oedipal symbiosis, unalienated labour, or other seductions to organic wholeness through a final appropriation of all the powers of the parts into a higher unity. In a sense, the cyborg has no origin story in the Western sense - a 'final' irony since the cyborg is also the awful apocalyptic telos of the 'West's' escalating dominations of abstract individuation, an ultimate self untied at last from all dependency, a man in space.[47]

For Haraway, the Cyborg is a paradigmatic emblem of the posthuman ethos who exists in what Foucault would call a relation of similitude.[48] Cyborgs have neither a beginning nor an end. Without a determinable point of origin even the present condition of humanity can be understood as already (and always) cyborg in nature. Haraway notes that the implications for this reach back

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[46] Haraway, "A Cyborg Manifesto", 149.

[47] *Ibid.*, 150-1.

[48] Michel Foucault, *This Is Not a Pipe* (Berkeley: University of California Press, 1982), 44.

to western Christendom's myth of origin, noting that there is neither a Garden of Eden behind nor a heavenly Jerusalem ahead,[49] as within cyborg culture there is only human-machine co-evolutionary development. The cyborg, as posthuman emblem, indicates the promise of freedom from the dialectics imposed by a Cartesian or a Hegelian metaphysic:

> Pre-cybernetic machines could be haunted; there was always the spectre of the ghost in the machine. This dualism structured the dialogue between materialism and idealism that was settled by a dialectical progeny called spirit or history, according to taste. But basically, these machines were not self-moving, self-designing, autonomous. They could not achieve mans' dream, only mock it. They were not man, an author to himself, but only a caricature of that masculinist reproductive dream. To think, they were otherwise was paranoid. Now we are not so sure. Late twentieth-century machines have mad thoroughly ambiguous the difference between natural and artificial, mind and body, self-developing and externally designed, and many other distinctions that used to apply to organism and machines. Our machines are disturbingly lively and we ourselves frighteningly inert.'[50]

The ghosts have been exorcised from the posthuman cyborg's world of hybrids and networked complexities. As a final note of victory for materialist left-Hegelian thought, the metaphysics of being are no longer regarded as that which is constitutive of reality. For Haraway, in a microelectronic age essences are replaced by actions and the good is determined by mere efficiency:

> We cannot go back ideologically or materially. It is not just that 'god' is dead; so is the 'goddess'. For both are revivified in the world shared with microelectronic and biotechnological politics. In relation to objects like biotic components, one must think not in terms of essential properties, but in terms of design, boundary constraints, rates of flows, systems logics, costs of lower constraints.[51]

As has been noted above, death of essentials and the death of metaphysics can be read in connection with the death of God; digital representations, the abyss of cyberspace, and the ubiquity

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[49] 'Cyborgs would not recognize the Garden of Eden; it is not made of mud and cannot dream of turning to dust....Cyborgs are not reverent; they do not remember the cosmos. They are wary of holism, but needy for connection...', *Ibid.,* 150-1.

[50] *Ibid.,* 152..

[51] *Ibid.,* 162..

of computing offer a functional equivalent for the role of the Divine in the posthuman/cyborg imagination. 'Modern machinery is an irreverent upstart god, mocking the father's ubiquity and spirituality.'[52] Though the metaphysical category of ubiquity still has resonances in the cyborg-age, along with notions of body, gender, god or goddess, its application has been repurposed. Cyberspace and 'virtuality' have, with rapacious appetites and without respect for origins, challenged the underlying meanings of language, sign, and symbol. Just as the terms virus, icon, scroll, button, mouse, screen, desktop, and even computer have been de-materialised through their translation into virtual equivalences; in the microelectronic post-industrial world, the careless semiotician may inadvertently also transform or transduce[53] into purely immanent cyber-signifiers those meaning bearing symbols which have traditionally been used to reflect transcendence.

Complexity as Metaphysics

Posthuman theory situates knowledge (epistemology) and being (ontology) within the broader contexts of one's embodiment within the world. As noted above, the Cartesian unified and rational subject is regarded within such discourse as having been dissolved. The remaining 'self' is no longer viewed as a separate entity, but as an embedded subject within the world. Nature, culture, technology and subjectivity are both emergent properties of the cosmos, and interconnected entities within the cosmos. Within posthuman theory, technology is of particular significance in constituting an expanded and expanding humanity. The use of technology as an extension of agency and will is seen as a *de facto* extension of the human subject.[54]

The complex interrelationships which comprise self and knowledge are embraced in posthuman theoretical discourse alongside a general acceptance of complex-system theory.

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[52] *Ibid.*, 153..

[53] See: Adrian Mackenzie, *Transductions: Bodies and Machines at Speed* (London: Continuum, 2002).

[54] By way of contrast, whereas the mind/body problem in posthuman speculative science will be described in the section below as a problem of extircat6ing one's mind from one's body and one's body from one's environment; in posthuman theory it is argued that 'mind and body cannot be absolutely distinguished and the body and the environment cannot be absolutely distinguished'; one is one's mind in one's body in one's environment. Robert Pepperell, *The Posthuman Condition: Consciousness Beyond the Brain* (Bristol, UK: Intellect, 2003), 22.

Complexity theory favours the *gestalt* over and against the individual facet of a system. In terms of subjectivity, this emphasises the non-linear non-locality of the subject, who is instituted by 'dynamic, interrelated events involving multiple stimuli and responses occurring simultaneously throughout being.'[55] Posthuman thinkers such as Pepperell, Haraway, Latour and Steven Levy (the creator of 'Artificial Life') regard the system or the network as that which is the locus of meaning and value in what they regard to be either a posthuman or postmodern age.

With respect to subjectivity, such thinkers would acknowledge the phenomenon of embodied consciousness to be purely epiphenomenal to biology. The mind, though always embodied, is an emergent property of the complex biological and neurological systems which compose the body. This view heartily refutes reductionism as an overly simple and totalising means of arriving at self-interpretation, and also holds in low regard any attempt to find an essential or singular explanation for conscious phenomena. Meaning and symbol emerge out of systems too complex to fully grasp; complexity is the new mystery.

Within posthuman theoretical discourse, the move away from metaphysics and the subsequent move towards the complexity of the network is a direct result of modelling technologies which rely upon advanced information technologies. Complexity theory, et al, is based on the idea that complex systems can be understood if simulated and modelled. Yet modelling such systems requires a level of mathematics that can only be calculated on sufficiently robust computer systems.[56] From its inception, the development of computer technologies has been oriented towards the pursuit of new scientific and technological insights into the meaning of the complexity of the cosmos. For posthuman theorists, the rhetoric of complexity has replaced what in the postmodern treatment of metaphysics are questions related to the possibility of ontology and the uncertainty of epistemology. Indeed, within a world that is described on purely materialist terms,

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[55] *Ibid.*, 25.

[56] John Mauchly, part of the engineering duo Eckhart and Mauchly who designed the world's first commercially viable digital computer, initially pursued electronic calculation in order to model, understand, and predict complex weather systems. Scott McCartney, *Eniac* (New York: Berkeley Book, 1999), 34.

posthuman theorists have found there to be something missing in their cosmologies of mere matter and energy, namely, 'some principle of order or structure...and information appears to be the needed ingredient.'[57] With complexity theory, both being and knowledge are regarded to be grounded within the myriad complexities of world and brain. Sufficiently interconnected material substances allow for the emergence of complex and seemingly meaningful realities. Though complexity theorists see their work as a way of overcoming the demise of metaphysics, and as a key to unlocking the indeterminate meaning bearing signifiers of vast networks; it functions as merely a chimera of mystery.

The calculative facilities of computing have given birth to such concepts as Chaos theory (the qualitative study of unpredictable dynamic systems), Catastrophe theory (which argues for the general unpredictability in the ordered universe) and Complexity theory (which argues that when upset, predictability leads to unpredictability which cannot be defined by specific components). All three seek to find a form of scientific knowledge at the liminal space between order and chaos;[58] a knowledge which is only knowable through a system's representation in the advanced simulations made possible by computer technology.[59] Out from this complex and interconnected milieu, posthuman theory and cyborg-feminism seeks to use images derived from fiction in order to pursue a kind of subjectivity which uses the new-metaphysics of complexity to situate identity,

Conclusion

Posthuman theorists such as Haraway have set a precedent for applying post-industrial technology in the service of self-interpretation. The academic texts which follow in the wake of

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[57] Albert Borgmann, *Holding on to Reality: the Nature of Information at the Turn of the Millennium* (Chicago: University of Chicago Press, 1999), 11.

[58] I am taking liberties with Mitchell M. Waldrop's *Complexity* which discusses the principal of self-organisation in complex systems of multiple interactions. Mitchell M. Waldrop *Complexity: The Emerging Science at the Edge of Chaos and Order* (New York: Touchstone, 1992), 63,

[59] For information on Chaos Theory see: Stephen H. Kellert, *In the Wake of Chaos : Unpredictable Order in Dynamical Systems*, Science and Its Conceptual Foundations series (Chicago: University of Chicago Press, 1993); for information on Catastrophe theory see: Peter Timothy Saunders, *An Introduction to Catastrophe Theory* (Cambridge: Cambridge University Press, 1980); for information on Complexity theory, see: Steven Levy, *Artificial Life* (Toronto: Vintage Books, 1992).

Haraway's work continue to advance her position that post-industrial technologies and the image of the cyborg problematise given understandings of gender, identity and sociality.[60] Ironically, however, Haraway and her followers, in their flight away from the totalising forces of gender typology, run open-armed into the cybernetic totalism and technological essentialism which is endemic to the complexity under girding their thinking. As discussed in the previous section, technological essentialism views technology as an uncontrolled and uncontrollable force which exists without governance from human culture or values. Cybernetic totalism asserts that cybernetic technologies, through their capacity to model and provide predictive insight into the world, give humanity the greatest means of understanding all facets of existence. In posthumanism, the elevation of technology as an essential element to human development and evolution (rather than as a parallel a segment within cultural life) and the prevalence of uncritically naïve appropriations of cybernetic technologies, simply shifts the locus of dominating control from what Haraway argued to be masculine strictures to cybernetic modes of discourse and technological developments. Rather than working through the implications of postmodern philosophy and culture (by exploring the problems of totalising discourse, questions of essentialism or metaphysics), the rhetoric of cyborg theorists merely assigns ontological weight to complexity discourse by substituting the language of 'systems' and 'emergence' for what in the Classics and

[60] Cyborg devotees are responsible for a number of collected works with variously overlapping essay contents. Notably, Chris Hables Gray, ed., *The Cyborg Handbook* (New York: Routledge, 1995) is a collection of essays tracing the technical and theoretical history of cyborgs through a compilation of cyborg-oriented source materials; Gray followed up this work more recently with his *Cyborg Citizen: Politics in the Posthuman Age (London: Routledge, 2002)*, which deals with the political implications of posthumanism. Though a pithy and entertaining read, his political theories are merely a regurgitation of the same grass roots models of governance that are perpetuated by the anarchist and leftist aspects of posthuman theory. A more ciritcal look at cyborgs and gender can be found in Gill Kirkup, ed., *The Gendered Cyborg : A Reader* (London: Routledge, 2000), as well as Jenny Wolmark, ed., *Cybersexualities : A Reader on Feminist Theory Cyborgs and Cyberspace* (Edinburgh: University of Edinburgh Press, 1999).

Theology was once called 'metaphysics.'[61] Though thoroughly anti-modern, posthuman theorists, through their elevation of the mysterious qualities of complexity, re-instantiate (unwittingly or ironically) a highly modernist understanding of being and knowledge.

I disagree with the cyborg-theorists/feminist's use of science fiction posthuman imagery to critique contemporary post-industrial culture. I argue that a critique of contemporary technology can already be found in the very works of cyberpunk and postmodern science fiction which Haraway, et al. use as a source for their reflections. As argued earlier in this chapter, fiction already explores the problems of the human use of human technologies. If fiction is regarded as cultural critique and not mere futurological entertainment, I believe that science fiction literature and film can lead to an ethics of technological practices which reasserts humanist values in the face of an unbridled use of contemporary information technology.

[61] See the use of complexity in Pepperell as a cipher for spirit: 'The "immaterial spark of life" may be nothing but the appearance of complexity.' Robert Pepperell, *The Posthuman Condition: Consciousness Beyond the Brain* (Bristol, UK: Intellect, 2003), 27.

Chapter 8: Posthumanism in Practice – Speculative science and the demise of the symbolic

Moving from the imagined posthuman scenarios in fiction and theory, this chapter will analyze three visions of a posthuman future within speculative science. Particular attention will be given to robotics expert Hans Moravec, physicist Frank Tipler, and engineer/futurologist Ray Kurzweil. In the non-fiction literature that discusses the posthuman condition written since the mid-1990's, Moravec and Kurzweil appear, if only in mention, with almost ubiquitous frequency. These two leading scientist provide the material framework and the speculative expertise for what in fiction and film is pure imagination. The importance of their work for this thesis lies in their explicitly theological and eschatological application of present and future technologies for the ultimate salvation of both the cosmos and humanity. Yet, despite the prominence of these themes, and despite their frequent mention within contemporary posthuman literature, their work has received surprisingly little critical reflection within academic theology. The chapter below hopes to rectify this abeyance, by exploring their work in depth, with specific interest in engaging with the latent theological implications of their thought. Yet before we can engage with the theological problems of posthuman speculative science, a few perfunctory words must be said regarding the role of technology as a conveyance for myth, symbol and sign, the difference between speculation and imagination, and the distinctiveness of a Christian eschatology

Technology, Myth, Symbol and Sign

Technologies, as was discussed at great lengths in the first section, are objects which extend human agency and will whilst remaining ontologically differentiated from human being. In this thesis I have argued that the meaning of technology can only be found at the nexus of a given technology's invention and application. There is therefore no 'essence of technology' nor 'essence of technologies' as talk of essences implies an immutability which is utterly foreign to the ever changing forms of technological development. Technologies operate within prescribed notions of causality which are imposed upon them by their makers or users. They are intended for particular tasks and do these tasks in service to human will. Technologies are neither good nor evil, although the systems within which they operate – and the operators which establish and work within such

systems and technologies – can be. The definition of technology advanced early in this thesis was one which sought to wrestle responsibility and control away from the objects of technology themselves, and to place the onus of ethical liability firmly back in the hands of human users and designers. As we shall note in this chapter, my call for a hermeneutics of technology is ignored within the posthuman speculative sciences, where technological essentialism and cybernetic totalism contribute to the promotion of information technologies as a means of conveying ultimate concern.

In light of the definition of technology already advanced, how can something as straightforward as technology ever give rise to something as symbol-laden as discourse regarding ultimate concern? Given the transparent and predictable nature of technology, it would appear that technology and symbolic discourse share a natural antinomy. One could say that the contemporary situation is one that could be typified by a gradual decrease in the value of symbolic systems of discourse, corresponding to increased technical literacy in culture.[1] Dillistone argues that symbols in a technological world lose their power for two reasons: a) shifting changes in the role of religion in explaining the meaning and origin of the cosmos, and b) the move away from a platonic metaphysic where earthly phenomena can be traced back to a perfect transcendental form. In contrast to symbols, technologies for Dillistone appear to operate as unambiguous signs which point to 'direct correspondence' between the thing being represented and its representation.[2] Whereas symbols retain a high degree of ambiguity and rely upon interpretation in order for their underlying meaning to emerge, '[s]igns do not require anything transcendent or ultimate to under gird them'.[3] The symbol is open to interpretation, yet the sign closes-off possible future discourse by unambiguously pointing to the reality which it represents.

Technologies-cum-signs point to no other reality than the causal effect to which a technology has been designed or applied. However, and perhaps paradoxically, both signs and technologies

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[1] F. W. Dillistone, *Traditional Symbols and the Contemporary World*, Bampton Lectures 1968 (London: Epworth Press, 1973), 6.

[2] *Ibid.*, 163.

[3] *Ibid.*, 168.

can become conveyances for the symbolic when their unambiguous meanings become obscured by their ambiguous applications. The relative clarity of a sign's message depends entirely upon the context within which it is read. As the Messianic secret in Mark's Gospel indicates, the symbolic significance of the 'signs' indicating the coming of the Kingdom, can only be accurately read by those in possession of the right hermeneutic.[4] Likewise, the native un-ambiguity of technology becomes obfuscated when the effect of technology upon its object is confused with the affect of technology upon the subject. As was noted in chapter three's discussion of Tillich's philosophy of technology – technology itself may be both neutral and unambiguous, but its application is neither. Thus, to understand the cultural ambiguities of technology use, one must differentiate between the effect of a technology (as regards its causality) and the affect of a technology (as regards its significance).

The effect of technology is caused by the design and operation of technologies, imposed upon material objects by technology's creators and/or operators. The affect of technology is caused by the subjective appraisal of such technologies; where the awe and wonder of a technology's abilities eclipses the brilliance of a technology's creator or user. To use an example borrowed from Paul Tillich, it is entirely appropriate for one to experience a sense of awe in the presence of great seafaring ships, airplanes or other objects of technological production, but it is inappropriate when the '*eros*' which is directed towards the 'technical gestalt' becomes fixated on the technical object rather than the combination of subject and object which is combined within the whole of a technology.[5] To focus on the affect of technology is to merely praise the creation, to make the object itself the entity which is the source of one's admiration.

It is precisely this problem of misappropriated affection, or a technologically influenced concupiscence, that plagues the examples of the speculative sciences below. Uncoupled from

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[4] Compare the demand for signs by the Pharisees in Mark 8.11-12, with the signs of false messiahs (Mark 13.22), and the sign of the betrayer (Mark 14.44). Contrast this with the signs of the Kingdom, given to the believers (Mark 16.17) and intelligible by believers (Mark 16.20).

[5] Paul Tillich, *Systematic Theology*, 3 vols., vol. 3 (Digswell Place, Welwyn, Herts, England: James Nisbet & Co. Ltd., 1964), 274.

either governance or human need, technologies – such as those in the purview of the speculative sciences – give rise to symbols and myths that offer immanently realisable solutions to existential concerns. Hence, the relatively straightforward sign-like behaviour of technology becomes obscured by the symbols which arise from a primarily affective reading of technology. In the imagination of fiction, this led to critique of present-day technological practices, by encouraging technology-users to grapple with the image of a fictive posthuman. In the speculative sciences, however, this mythological significance will instead lead to an inauthentic expression of ultimate concern, where technologies themselves point to what is mistakenly perceived to be a more authentic form of subjectivity.

Posthuman futures: Speculation or Imagination?

If both posthuman science fiction and posthuman speculative science give rise to a mythological or symbolic interpretation of information technology, what makes the myths of fiction something to be preferred over the myths of speculative science? I would argue that the chief distinction between the two can be explained by the subtle difference between imagination and speculation, with particular interest in the hermeneutic consequences of either. In science fiction, the role of technology is to create a fictional image or trope which brings to the surface a mythic world that encourages a reflective engagement with technology in the present-day world of the reader/viewer. These myths are patently fictive and encourage demythologisation when put to the service of a movement of ethical reflection. As denuded myths a post-critical symbolism is allowed to emerge which allows science fiction literature and film to serve as an authentic means of social critique. As noted in the previous chapter, science fiction once demythologised encourages critical reflection on present-day technological practices.

In contrast, speculative science employs technology as a foundation for a myth which is itself the basis of a self-authenticating hope. Science fiction, when demythologised, uses technology to tell a story which figures the future (or alternative present) in order to point back to the real-present. Speculative science uses technology only to depict human technical ability as the means of achieving a better future. It represents a pre-critical myth which is neither interpreted, demythologised, nor open to critique.

Perhaps speculative science would be better understood if juxtaposed with the well-established scientific practice of the thought experiment, where a line of questioning is pursued en lieu of empirical observation. The well known example of Schrödinger's cat is a thought experiment which describes the problem of simultaneity in quantum states. No one would ever argue that Schrödinger's cat actually existed as simultaneously alive and dead,[6] yet in the context of speculative science an outlandish claim of this ilk could be made. Speculative science could argue that our knowledge of quantum mechanics is presently incomplete, but perhaps in the future simultaneity will be more fully understood, whereby there could be such things as alive-dead cats. Though crippled by the possibilities of science and technology in the present, speculative science holds out hope for the future as the place where the mysteries of science can be resolved, and the present-day limits of technology can be exceeded.

It is an unwavering faith in the myth of progress which prompts the speculative scientists described below to combine a hope for a technologically improved future with their formidable scientific expertise. Whereas thought experiments can usefully produce theories that may later be proven or disproved, it would seem that speculative science only promotes a futurological outlook which invests the future, as an extension of the present, with utmost significance.[7]

As has been stated above, the fictive imagination in posthuman science fiction is not made dependent upon technology, real or otherwise, for the communication of its story. In fiction, technology is unencumbered by history or fact. Within this imagined world, the connection to the reader's present is established from the perspective of the future (as if looking back on to he

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[6] Apart from a very clever work of fiction which teases out the implications of such an outlandish claim. See: Andrew Crumey, *Mobius Dick* (London: Picador, 2004).

[7] It should be noted that my use of speculative science is distinct from the use of the term as a synonym for theoretical knowledge. For Thomas Aquinas, theology was a speculative science because it only taught of a substance (God) which could only be affirmed but not verified. Thomas Aquinas, 'Summa contra Gentiles' in, *Selected Writings* (New York: Penguin Classics, 1999), 285-88. Likewise, in this sense, Schleiermacher distinguished between speculative science and religion, noting that for the former the object was pure theory, whereas for the latter the object was the feeling of ultimate dependence. Hans L. Martensen, *Between Hegel and Kierkegaard*, trans. Curtis L Thompson and David J. Kangas (Oxford: Oxford University Press, 1997), 125.

present from afar) rather than from the perspective of the present (as if looking ahead to the future). The imagination of posthuman science fiction is an imagination of the future which reaches back into the present, and in so doing confronts the present with a picture of otherness that encourages reflective critique. By contrast, speculation, at least in the way in which the term is employed in posthuman speculative science, is grounded in a familiarity with the present which projects onto the future an informed guess of what *could* be in light of what *is*. Speculative science looks to the future for its ultimate goal and in so doing views the present only in terms of its ability to procure this future goal.

A Posthuman Eschatology

A common theme in the myth of posthuman speculative science is a belief that advanced forms of information technology will, in the future, be able to accommodate radical forms of life extension. The ability to employ technology to stave off death as long as possible, has given the posthuman speculative scientists noted below a sense of confidence in their craft's ability to bring ultimate solution to the problem of finitude, especially when cast in terms of personal mortality. As we shall see, however, the possibility of eliminating death does not correspond to an elimination of all human deficiencies.[8]

Yet, how does the myth of this technological eschatology contrast with Christian eschatology? The final written words of Dietrich Bonhoeffer, 'This is the end – for me the beginning of life,'[9] reflects the mysterious relationship which Christian eschatology has to the reality of personal death. Death is not something to be scorned, rejected, or postponed for an indefinite amount of time. Indeed, the relationship between created and creator noted in chapter six, bespeaks the fact that all life is in the hands of God and the act of ultimate trust in God is the surrender of one's life to the providence of the Divine will. As intimated by Bonhoeffer, the Christian reaction to death is one

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[8] Fukuyama argues that radical life extension would cause an excessive valuation of human life, eliminating the possibility for altruism. Francis Fukuyama, *Our Posthuman Future: Consequences of the Biotechnology Revolution* (London: Profile Books, 2003), 67, 71.

[9] Dietrich Bonhoeffer, *Letters and Papers From Prison*, ed. Eberhard Bethge (New York: Macmillan, 1967), 225.

of victory over death. Pauline eschatology hails the mystery of imperishablity for those in Christ for whom 'Death has been swallowed up in victory' (1 Corinthians 15.55).

Posthuman eschatological hopes are at best for a radical extension of life. Yet the postponement of death is quite a different from the idea of death being conquered or vanquished, as a whole. Paul's laud of victory over death is saturated in Christological overtones. Death is made impotent because it has been conquered by Christ's own movement through death to resurrection. It is by following Christ's example that Paul admonishes his readers to be confident in their own fate through death. Indeed, for the Christian the avoidance of death is tantamount to an avoidance of salvation. At the end of posthuman life extension, death postponed still awaits its claim. Christian eschatology paradoxically calls death a defeated foe and embraces death as the transition into life eternal, as it is the symbolic means by which eternity is realised through the resurrection of the body.[10] Unlike the Hebrew Bible which lauds mythic longevity as a sign of divine blessing,[11] Christianity needs death for the transformation that is a transfiguration of the fleshly body. It is a naïve obsession with the present that encourages posthuman speculative science to avoid death at all possible costs. This is furthermore an expression of speculative science's inauthentic theological model, which seeks to facilitate ultimate concern through immanently realisable solutions.

Having now discussed the mythic, symbolic and eschatological implications of speculative science, in the remainder of this chapter we will engage with the posthuman speculative science of Moravec, Tipler, and Kurzweil, noting the techno-theological significance of each.

A survey of Posthuman Speculative Science

Moravec – advanced robotics and posthuman 'mind children'

Hans Moravec, a research professor at the Robotics Institute of the Carnegie Melon University, specialises in autonomous robot mobility. An established and highly regarded robotics engineer with an extensive list of patents and academic publications to his name; Moravec's work is driven

[10] Note the discussion of heaven as the illative of the doctrine of justification on pp.181.

[11] See Melchizadek in Genesis 14 for but one example of mythic longevity.

by a desire to see autonomous self-mobile robots commercially available by the end of the decade.[12] Despite the highly pragmatic nature of his primary area of research, Moravec's more speculative work centres on the broadly sweeping implications of evolving robotic intelligence and dexterity. In his principle writings on speculative science, *Mind Children* (1988) and *Robot* (1999), Moravec describes the technical obstacles which must be overcome in order for the posthuman evolution of robots to ensue. He describes with great clarity the trajectory of developments within information technology which he believes will lead to the creation of artificially intelligent robots. In addition to creating autonomous forms of artificial life, Moravec believes that robot evolution will eventually provide the technology for the re-instantiation of human consciousness into a computerised and robotic medium.[13]

Consistent with other contemporary applications of robot technology, from the Mars Rover to industrial manufacture, the robots being developed currently by Moravec are intended to be put to use in environments where humans have traditionally been unable to thrive. Such robots liberate their human users and designers from the lethal repercussions of fate or bad judgment. As devices which extend the horizon of human action, Moravec views Robots as more than tools for the manipulation of the physical world, but as devices which enable their human operators (or programmers) to skirt around the basic limits of human finitude. By plunging robots into outer-space, distant planets, or even in the forges and assembly lines of contemporary industry, he would argue that human will and agency are extended into domains which are only knowable through

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[12] See Moravec's work with the SEEGRID corporation: http://www.seegrid.com/pages/about.html. In particular: Moravec's efforts to develop three dimensional navigation in automated mobile robotics has most recently explored the problems associated with colour perception in the artificial eye. See: Hans Moravec, *Robust Navigation By Probabilistic Volumetric Sensing*,·(Carnegie Melon University, 2001/03/20 [cited 13/4/2005]); available from http://www.frc.ri.cmu.edu/~hpm/project.archive/robot.papers/2001/ARPA.MARS/Report.0103.html

[13] Moravec's work does not focus exclusively on the technical hurdles which stand in the way of viable robotic life, but is rather centred on the religious and social implications of AL/AI. This is in contrast to Maureen Caudil whose work, though operating from a similar perspective as Moravec's she argues for the viability of her thesis from purely a technological perspective. See: Maureen Caudill,. *In Our Own Image: Building an Artificial Person*. Oxford: Oxford University Press, 1992

their technological mediations. Seen as extensions of human being, robots in the present are only quantitatively distinct from what Moravec describes as a 'postbiological' future. Yet Moravec's vision of future robotic technology hopes for more than the extension of agency and will, but a time when robotic 'life' will surpass human life as the more durable and malleable incarnation of human evolution. He notes, 'What awaits is not oblivion but rather a future which, from our present vantage point, is best described by the words "postbiological" or even "supernatural". It is a world in which the human race has been swept away by the tide of cultural change, usurped by its own artificial potency.' [14]

Moravec views this future as the consummation of humanity's historical courtship with technology. From the first stone tools to the most advanced forms of robotics and artificial intelligence, humanity has lived as a hybrid species, whose will and agency have been partly instantiated within a biological body and partly instantiated within an ever developing technological body. Put tersely, Moravec describes present-day humanity as 'uncomfortable halfbreeds.' Thus in the future, faced with an increasingly inhospitable environment and an unquenchable desire for longevity, humanity will be forced to divest itself from its natural situation in the world and surrender completely to a purely technological mode of being, created *by* humanity *for* humanity.

Moravec's primary reason for pursuing robotic technology and artificial intelligence as the ultimate solution to the problem of human finitude reflects what he sees as the inherently inhospitable nature of contemporary technological life. Humans live in a world which outpaces the finite limitations of the human physiology and psychology. Moravec writes:

> We have a Stone Age brain, but we don't live in the Stone Age anymore. We were fitted by evolution to live in tribal villages of up to 200 relatives and friends, finding and hunting our food. We now live in cities of millions of strangers, supporting ourselves with

[14] Moravec, Hans. *Mind Children: The Future of Robot and Human Intelligence*. London: Harvard University Press, 1988, 1

> unnatural tasks we have to be trained to accomplish, like animals who have been forced to learn circus tricks.[15]

Accordingly, the only way for humanity to endure the speed and the depth of contemporary existence is to increasingly rely on technologies to mediate the world in a way which compensates for the limitations of our 'Stone Age brain.' The externalising of cognitive function in the use of computers to think with and for humans, coupled with the extension of human activity through the use of robots, prosthetics and other tools, is for Moravec the first step towards an eventual abandonment of the physical biological body for a new body which will be crafted with the needs of the technological world in mind. Despite the many changes in temporality, spatiality, sociality and interiority[16] which would accompany a radical reinstantiation of human being into posthuman physiology, Moravec would argue that posthuman beings are our 'mind children', descended from the human drive to self-perfection, and related to us by sharing with us our basic intelligence. For Moravec, the space between the human and the posthuman is a continuum of human evolution coupled with technological development.

Resurrection into Continued Finality

There are two themes in Moravec which correlate to similar themes in Christian eschatology. The first asks after the nature of the eternal kingdom and the second explores the fate of the personal soul. In Moravec's techno-theological eschatology, he predicts a technologically mediated eternal kingdom. Like the Christian Kingdom of God which exists as a partial reality in the present and a full reality in the future, the techno-Kingdom of posthuman speculative science is read as an emerging reality which will be consummated in a not-too-distant future. Though a

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[15] Hans Moravec in an interview with Charles Platt, in: Charles Platt, "Superhumanism," *Wired*, 3, no. 10 (1995). Journal Online. Available from http://www.wired.com/wired/archive/3.10/moravec.html?topic=&topic_set=

[16] Moravec speculates extensively on the nature of posthuman robotic life. He notes that posthumans will be social (Moravec, *Mind Children*, 110), but that the physical means of sociality (the posthuman body) will radically change the experience of subjectivity (*Ibid.*, 114). Chiefly, posthumans will be able to control their own experience of the world, by altering the variables in the software programme that is the conscious mind.

posthuman eschatology attempts to wrestle with similar themes present also within Christian eschatology, a Christian eschatology is ever aware that the fulfilment of its hope lies in the hands of the God who is in control of history, in contrast to a posthuman eschatology which places the onus of control upon technology itself.

Moravec's posthuman future raises serious question regarding one's persisting identity after being resurrected into a cybernetic body. Like so much Christian theology which has appealed to a dualism between body and soul to 'reasonably' argue for the persistence of identity following death; posthuman speculative science also appeals to a notion of dualism which separates the body and the mind as two distinct entities. Thus, for Moravec, the 'essence' of humanity is the human mind; an epiphenomenon which is produced by the brain to functions as the body's software. As software, mind is as transferable (portable and interoperable) as any other piece of software that I might load onto a disk and move from one computer to the next. For Moravec, neither the body, nor the world, nor community, affect the subjective experience of mind. Indeed, any subjective experience is merely 'an abstract property shared by all patterns', meaning that whether instantiated in a computer or in my own body, 'a person would feel the same.'[17] In order for Moravec to advocate a posthuman future with some form of continuity between one's old embodiment in the flesh and one's new embodiment in a technological-body, he must reject any notion that the physical body is somehow required for human consciousness. He asserts that if the patterns and processes of the mind are preserved, 'I am preserved. The rest is mere jelly.'[18] Rather than the body, it is patterns which constitute identity and codes which define persons; thus humanity is ultimately reducible to a collection of bits and bytes.

Moravec commits the already described fallacy of technological essentialism, by arguing that technology is a force which will increasingly improve and in so doing fulfil the ultimate needs of human destiny. Moreover, his blind belief in information technology as the means by which future humanity will experience radical life extension, confirms him as a cybernetic totalist who believes

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[17] *Ibid.*, 178

[18] *Ibid.*, 117

that reality is better understood through cybernetic mediation. Moravec belies a pessimistic optimism. He is pessimistic about the future state of a world which necessitates such invasive technological solutions to the problem of human finitude, yet he is optimistic in technology's ability to supply for this need. Though philosophically we can dismiss Moravec's optimism, and perhaps even technologically we could undermine the feasibility of his plans, a more pressing question is one which explores the intent behind such a blatantly eschatological reading of future information technologies. The answer to this question will be offered in the conclusion of this chapter.

This chapter, in providing a concrete example of the techno-theology which arises from the culture surrounding information technology, argues that Moravec, along with Kurzweil and Tipler (below), read into the potential of information technology an expressly theological concern. In their scientific context, where existential need can only be resolved by immanent means, transcendent hope is a notion which contradicts the need for scientific verifiability. Their posthuman speculative science reflects science's inauthentic attempt to satisfy ultimate concern with a language that misunderstands authentic theological discourse.

Tipler – The 'Omega Point' and the conscious cosmos

The technological landscape of the posthuman future described in Moravec (above) and Kurzweil (below) finds an interesting compliment in Tulane University physicist Frank Tipler's *Physics of Immortality.* Like Kurzweil and Moravec, Tipler takes up the possibility of a posthuman future through the rubric of technology-enabled life extension. Human finitude – and indeed, for Tipler, cosmic finitude – is an existential concern to which information technology may provide an ultimate solution. Rather brashly he begins his study by arguing that 'theology is a branch of physics and that physicists can infer by calculation the existence of God and the likelihood of the resurrection of the dead to eternal life...'[19] In an attempt to arrive at a 'universal' theological language, Tipler appeals to what he sees to be a sense of universal eschatological hopes that are

[19] Frank Tipler, *The Physics of Immortality: Modern Cosmology, God and the Resurrection of the Dead* (London: Doubleday, 1994), iv.

reflected in all the 'great religions of the world'. This is the starting point for his physical theology. Yet, rather than turning to transcendental symbols or religious discourse, Tipler seeks to ground his eschatology in scientifically verifiable and technologically realisable solutions.[20]

As was the case with Moravec, in order to promote a form of life extension where one's subjective experiences and consciousness can be instantiated in a substrate different from one's own physical body, Tipler appeals to a pattern-based understanding of identity. Accordingly, one's mind is understood as a composite of one's neuropathology. Echoing Moravec he writes, 'the pattern is what's important, not the substrate.'[21] Human mind can exist forever, assuming that the machines which house and embody the human mind can last forever as well.[22] Again like Moravec, embodiment – which is contingent upon ever-changing biological and technological realities – is not constitutive of the individual. Tipler defines sentient life as follows:

> I claim that a "living being" is any entity which codes information (in the physics sense of this word) with the information coded being preserved by natural selection. Thus, "life" is a form of information processing, and the human mind – and the human soul – is a very complex computer program. Specifically a "person "is defined to be a computer program which can pass the Turing test...[23]

Making 'life' synonymous with information processing, allows Tipler to reduce the complexities of subjectivity into a form which can be readily modelled by computers. Modelling,

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[20] In light of the explicitly religious nature of Tipler's work, his self-admitted research into theology and religious studies, and the direct challenge which his position poses to a theological eschatology, it is surprising that he has received so little engagement within the context of academic Christian theology. Indeed, Tipler's work is also largely ignored by contemporary mathematicians and physicists, who simply appear baffled by what Tipler asserts regarding the mathematical origins of religious hopes. For two exceptions to this abeyance within theology, see the discussion of Tipler's reductionism in John Puddefoot, *God and the Mind Machine* (London: SPCK, 1996), 58, 62; and Michael Fuller's critique of Frank Tipler in his *Atoms and Icons,* regarding the inherent limits of scientific knowledge which are ignored by those proffering grandiose theories of everything. Michael Fuller, *Atoms and Icons* (London: Mowbray, 1995), 4.

[21] Tipler, *The Physics of Immortality,* 127.

[22] *Ibid.,* 125.

[23] *Ibid.*

as has been discussed elsewhere with regards to the computational analogy[24] and complexity theory[25], gives the impression that an object which is modelled is more clearly knowable, more easily understood, and most importantly, more readily controlled. The ability to model intelligence – which for Tipler is the fundamental essence of human life – provides Tipler with an ability to explore with certainty the long-range goals of posthuman speculative science. For Tipler, it is only natural that the 'next stage of intelligent life would be quite literally information processing machines.'[26] His eschatological speculations are grounded in a technological myth which resists any appeal to a transcendent divinity.[27] He seeks to make 'heaven as real as the electron'[28] by appealing to the most 'up-to-date knowledge of modern mathematics and physics.'[29] This approach differentiates Tipler from Moravec or Kurzweil, inasmuch as Tipler aims at exploring the long-range implications of posthuman life-extension by casting a technological eschatology as both individual *and* cosmic destiny. He argues that in order for humanity to fully embrace its own self-made immortality, the cosmos must be implicated in this pursuit.[30]

To achieve immortality in the face of certain cosmic finality, what for Tipler is the real challenge of posthuman speculative science, requires one to devise a way to persist the 'computer program' of the human soul in an incorruptible medium. But how can anything created in a finite cosmos truly be incorruptible? Even beyond the death of our own solar system, there exists yet an even *more* problematic boundary, which in Tipler's physics is termed the 'Omega Point' – the end of the Cosmos itself.[31] For Tipler, the greatest obstacle to immortality is the collapse of the

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[24] See the refutation of the computational analogy in chapter five.

[25] See the discussion of complexity theory in chapter seven.

[26] Tipler, *The Physics of Immortality,* 218.

[27] *Ibid.,* 125.

[28] *Ibid.,* xv.

[29] *Ibid.,* xvi.

[30] *Ibid.,* xiii.

[31] Tipler's work was anticipated by Jean-Francois Lyotard, whose own more philosophical (rather than scientific) reflections on the immanent end of the cosmos explored the possibilities latent within information science as a source of ultimate salvation. Jean-François Lyotard, "Can Thought Go on Without a Body?," in *Posthumanism* ed. Neil Badmington (New York: Palgrave, 2000), 132.

universe and the return to singularity – the moment wherein all matter and energy converge to a single infinitesimal point.[32] Yet Tipler's 'Omega Point' is strikingly different from the use of the same concept by early 20th century French theologian and palaeontologist, Teilhard de Chardin. Teilhard understood the Omega Point to be the end of cosmic history, both in terms of its completion/fulfilment and its ultimate goal.[33] The Omega Point was seen to be a term roughly synonymous with the being of Jesus Christ, and not dissimilar to the role of Ultimate Concern in Paul Tillich's theology (as ground of being) or Kingdom of God in Pannenberg's (as prolepsis of the cosmic end). Tipler's use of the concept is divested of Teilhard's theological teleology, as for Tipler Omega Point is nothing more than the absolute boundary of space and time, the fixed horizon at the end of existence. For Teilhard, surviving the Omega Point meant the fusion of spirit and matter into Christ. For Tipler, there is no spiritual undercurrent, only a mathematical formula which seeks to prove that at the point of singularity one could subjectively experience eternal life.[34]

Tipler in Dialogue with Theology

Tipler describes his so-called 'physics of immortality' as a new kind of natural theology, which resists metaphysical or transcendental claims in lieu of what he regards to be a thoroughly materialistic and scientifically verifiable system He is aware that his physical theology seriously impacts confessional theological belief, but argues that his thesis resonates deeply with 'contemporary protestant theology.' In particular he cites the work of Wolfhart Pannenberg noting

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[32] Tipler, *The Physics of Immortality,* 154

[33] See my discussion of Teilhard and Tillich in, Michael DeLashmutt, "Syncretism Or Correlation: Teilhard and Tillich's Contrasting Methodological Approaches to Science and Theology," *Zygon* 40, no. 3 (2005), 739-750.

[34] Subjective immortality is distinct from objective immortality in Tipler because he distinguishes between the real time of the cosmos and the subjective time experienced by life or the living. The former is bound by the cosmic horizon of the omega point, whereas the latter is bound only by the internal facilities of an information processing device. Thus, cosmic subjective immortality exists when the mind becomes persisted within a medium that is sufficiently robust enough to generate apparently endless experiences of subject temporality, which Tipler sees as being possible if the mind is instantiated within fabric of the cosmos itself, at Omega Point. Tipler, *The Physics of Immortality,* 138.

that Pannenberg believes that the identity of the 'present-day person is coded not only in the present-day spatio-temporal structure, but also in God.'[35] For Tipler, Pannenberg's understanding of eschatological personhood is the same as Tipler's own 'Omega Point Theory', where information about the person will be reconstructed at the cosmic collapse of the Omega Point. Though one may bristle at what appears to be the co-opting of Pannenberg's theology for the purposes of Tipler's posthuman speculative science; it would appear that Tipler's interpretation of Pannenberg may not be that far from the truth, as on his website he refers to personal correspondence with Pannenberg where Pannenberg offers the following veiled endorsement of Tipler's theories:

> Christian believers and their resurrection hope need not the difficult path towards resurrection via a change of the basis of intellectual life from old-fashioned organic life to a computer based life that might finally dominate in the universe. Communion with the crucified and risen Christ, who according to the Christian faith at present already participates in God's rule of the universe, is sufficient for the Christian as basis of the hope in their future participation in the resurrection of the dead. That does not exclude that the development of life in the universe may indeed take the course which Tipler describes. [36]

Despite Pannenberg's guarded approval of Tipler's work, there are serious issues which prohibit confessional theology from closely aligning itself with this approach. The least of which is the apparent elevation of human technique to the point of ultimacy. This is a tendency which seems endemic to Tipler's theology.

Much like Moravec and Kurzweil who regard the digital transformation of human being as the inevitable next step in human evolution, Tipler posits that 'the creation of such intelligent machines will be a matter not of "man playing God," but rather, of humanity ensuring a union with God.'[37] Upon enveloping the whole of the cosmos with intelligent life, humanity will become omnipresent,

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[35] *Ibid.,* 293.

[36] Wolfhart Pannenberg, *Modern Cosmology: God and the Resurrection of the Dead,*([cited 1/12/2004]); available from http://www.math.tulane.edu/~tipler/theologian.html.

[37] Tipler, *The Physics of Immortality,* 21.

omniscient, omnitemporal, and as far as it is allowed for within the omega point, omnipotent.[38] Thus, humanity itself, by using its technology to seed intelligence into the cosmos, becomes God. Tipler's God is no monolithic divine, but rather an emergent characteristic which develops within the evolving life forms of the cosmos. For Tipler, God only exists in as much as humanity possesses the potential to become God.

In a critique of Pannenberg's acceptance of Tipler, Sjored L. Bonting notes that the theology argued for by Tipler is inherently inauthentic because it confuses the roles of science and theology. Theology, according to Bonting, is concerned only with transcendental ideas whereas science is 'by definition limited to this world.'[39] Bonting goes on to argue that Tipler is unable to construct a valid theology, because his scientific language is unable to discuss the transcendental object of theology. Pannenberg rightly sees the limits of Bonting's critique: if science is the language of the world and cannot speak of the divine, it follows that theology, the language of the divine, is limited in its ability to speak to the world. Such an impotent theology contradicts the cosmic implications of Christian eschatological hope which demands universal import.[40] Though I agree with Pannenberg's assessment of Bonting, I cannot follow his endorsement of Tipler, no matter how caged it may appear. Principally, I believe that Tipler's 'science' is merely a capitulation to an essentialist philosophy of technology that has led Tipler into a form of cybernetic totalism. As such, his work, though clearly a significant intellectual exercise, is more a reflection of an uncritical reading of technology than it is a lasting bridge between science and theology.

Tipler's is a theology built on an unwavering certainty in technological practices and human progress. Recall that his work seeks to make 'theology... a branch of physics' whereby a 'physicists can infer by calculation the existence of God and the likelihood of the resurrection of

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[38] *Ibid.,* 153f.

[39] Sjoerd L. Bonting, *Resurrection and Hereafterresurrection and Hereafter* [website]·(, accessed 1/10/2005 2005); available from http://home.worldonline.nl/~sttdc/resurrection.htm.

[40] Wolfhart Pannenberg, *God and Resurrection – a Reply to Sjoerd L. Bonting* [website]·(, accessed 1/10/2005 2005); available from http://home.worldonline.nl/~sttdc/pannenberg.htm.

the dead to eternal life...'[41] Tipler's scientific inference is fundamentally distinct from Christian theology's eschatological hope. For Tipler, inference leads to probability which itself is a form of certainty in the potency of calculation. For Christian theology, hope is based upon the work of God in Christ, which effects a change to the underlying nature of reality which can only contingently be realised in the present. Certainly, theologians like Pannenberg seek to reasonably explain why Christian faith is plausible,[42] but even Pannenberg's work returns to faith – as the limit to reason – in grasping after the transcendent. In Pannenberg it is, after all, only by the divine spirit that God's activity in the world is accomplished and revealed.[43]

By making the human or posthuman subject a potentially infinite entity, and by making the means of this transformation human technical aptitude, posthuman speculative science advocates a purely immanentist theology which grounds hope (theological or otherwise) on speculated technological mythologies rather than hoped-for transcendental symbols. A Biblical cosmic eschatology, places as a mark over future human history both the ultimate power of God as the source and sustainers of life, and the determined yet unknowable plan of God to control the ends of history. It is, to echo the words of Hans Schwarz, a countermeasure against the contemporary obsession with the present.[44] The techno-theological eschatology of posthuman speculative science transforms eschatology itself into a technology which is controllable, controlling, and de-mystified.

Kurzweil – Spiritual Machines and the End of Death

We conclude this investigation of posthuman speculative science by engaging with the work of futurologist and entrepreneur Ray Kurzweil. Like Moravec and Tipler, Kurzweil approaches the inevitability of the posthuman union of technology and humanity as the next step in human evolution and, significantly, as the solution to the problem of personal human death. Also

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[41] *Ibid.,* iv.

[42] Hence the title of Stanley Grenz's work on Pannenberg, *A Reason to Hope.* See also, Wolfhart Pannenberg, *Metaphysics and the Idea of God,* trans. Philip Clayton (Grand Rapids: Eerdmans, 1988).

[43] Wolfhart Pannenberg, *Anthropology in Theological Perspective,* trans. Matthew J. O'Connell (Philadelphia, Pennsylvania: The Westminster Press, 1985), 515ff.

[44] Hans Schwarz, *Eschatology* (Grand Rapids: Eerdmans, 2000), 2.

consistent with others discussed in this chapter, despite his extreme faith in the future capacity of technology, Kurzweil is no crack-pot futurologist, but an established and highly respected engineer, entrepreneur, and inventor.[45] As is attested to by his early work, the majority of Kurzweil's life has been spent imagining and developing technologies aimed directly at improving deficiencies in human physiology. His work in recent years has transitioned from research into the palliative application of cybernetic technologies to alleviate visual and auditory disabilities, to the more systematically curative application of technology enlisted to overcome personal death. The trajectory of his thinking can be traced in his three principal works: *The Age of Intelligent Machines* (1989), *The Age of Spiritual Machines* (1999) and most recently, the ambitiously titled, *The Fantastic Voyage: Live Long Enough to Live Forever* (2004).[46]

Technology, for Kurzweil is an essential element of human being and is intimately connected with human evolution. Distinct from a tool – a device which according to Kurzweil is fashioned only to attend to the needs of a particular job – technologies are objects that are interwoven with human culture and destiny, persisting beyond the needs of the moment. They are the bearers of cultural information, inasmuch as the development of technology implies the progression and development of ideas from one successive generation to the next. He writes:

> Technology goes beyond the mere fashioning and use of tools. It involves a record of tool making and a progression in the sophistication of tools. It requires invention and is itself a

[45] He developed the first print-to-speech reading device utilising optical character recognition (OCR), the first character recognising flat-bed scanner, the first text-to-speech synthesiser, the first music synthesiser capable of recreating the grand piano and other orchestral instruments, and the first commercially viable speech recognition device. His foresight and innovation have earned him many awards and honours, including the Lemelson-MIT Prize, the world's largest award in invention and innovation; the 1999 National Medal of Technology, the United State's highest honour in technology awarded from former US-President President Clinton; the 1994 Dickson Prize (Carnegie Mellon University's top science prize), Engineer of the Year from Design News, Inventor of the Year from M.I.T., and the Grace Murray Hopper Award from the Association for Computing Machinery. Furthermore, Kurzweil's 'track-record' and his established role as an engineer, give his voice credence and his futurological prophecies the weight that warrant their treatment here. See Kurzweil's *The Age of Intelligent Machines* (Boston: MIT Press, 1990).

[46] For further information, see: Paul C. Judge, *Q&A With Ray Kurzweil*, (1998/02/18 [cited 30/11/2004]); available from http://www.businessweek.com/1998/08/b3566022.htm.

> continuation of evolution by other means. The "genetic code" of the evolutionary process of technology is the record maintained by the tool-making species.[47]

Like Moravec, who considered humanity to be a 'half-breed' species partially composed of a technological body and partially composed of a biological body; Kurzweil points to a twofold evolutionary process which, in creating humans and technology, anticipates the synergistic human-technology merger of the 'technology-inventing species with the computational technology it initiated the creation of.'[48] For Kurzweil, this human-technology merger will result in the creation of two distinct types of mind: an artificial mind which will emerge from the computer itself and a subjective mind which is transferred from the substrate of the human brain to the substrate of the computer. Thus, the title of his principal book, *The Spiritual Age of Machines,* reflects both the emergence of an independent machine-mind and the spiritual instantiation of the human mind in the computers of the future. Such machines, for Kurzweil, would consider themselves to be fully human, 'although their brains are not based on carbon-based cellular processes, but rather electronic and photonic "equivalents."'[49] More than simply artificial intelligence (an attribute which he believes can be ascribed to current computers); Kurzweil argues that his spiritual machines will possess a true self awareness and consciousness which he regards as being functionally equivalent to the human mind.[50]

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[47] Kurzweil, *The Age of Spiritual Machines*, 14.

[48] *Ibid.,* 255-6.

[49] *Ibid.,* 234. The role of functional equivalences is central to Kurzweil's thought, and in many ways endemic to the entire span of speculative science posthuman discourse. This is reminiscent of the equivalences made between human and machine labour in the Marxist critique of industrialisation; the equivalences between human and artificial purpose, action and teleology in Wiener's initial writings on cybernetics; or the equivalences between human consciousness and machine consciousness in Minsky's pursuit of a universal computation. Posthumanism, as regards the actual technologies which under gird this pursuit, is based upon the idea that the human and the non-human mirror each other in terms of function and ability. In Kurzweil, this is taken a step further, as even human bodies find their equivalent in the cybernetic embodiment of the posthuman person.

[50] See the discussion of computers and 'mind' in chapter five, with respect to strong-AI, pp.170. Despite Kurzweil's familiarity with Searle and Dreyfus' critiques of strong-AI, he remains ardent in his assertion that spiritual machines will both become the spiritual children of humanity (to borrow a

He couches his analysis of future technologies within a speculated trajectory of future computer developments, which are based upon his understanding of the past rate at which computer technology has advanced. Important to his argument is the constancy of what is referred to as Moore's Law, an informal rule of computer technology which predicts that the number of transistors per square inch of an integrated circuit will double every 24 months.[51] Graham Moore, the co-founder of the microprocessor manufacturer Intel, made this prediction in 1965 based upon the increased density of integrated circuits since their inception in 1959.[52] Although Moore predicted that this trend would continue into the foreseeable future, most experts (including Moore himself), do not hold this law to be an eternal constant.[53] Kurzweil, however, bases the entirety of his speculative science on the constancy of Moore's Law, which he believes will allow for development in technologies leading to the rise of spiritual machines.

Kurzweil promotes his argument by predicting a gradual internalisation of computer technology into the human subject. For Kurzweil, as was the case with Moravec, the clunky material interfaces which separate one's consciousness from the activities going on within one's computer will continue to disappear as technologies develop. What began with the erasure of wires connecting computer peripherals and computer networks,[54] will, in Kurzweil's speculation, lead to

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phrase used by Moravec) as well as the locus of future embodiments of present human consciousnesses. In the *Spiritual Age of Machines,* Kurzweil dismisses Dreyfus on two occasions. First, he cites how Dreyfus incorrectly predicted that computers would never be able to beat humans at chess (Kurzweil, *The Age of Spiritual Machines,* 70; Dreyfus, *What Computers Still Can't Do*, 101-6) and secondly, he refutes Dreyfus' insistence on the body as the locus of human consciousness, by asserting that bodies *will* be a part of the artificial human construct, though rather than physical, these bodies will be virtual (*Ibid.,* 134).

[51] Gordon E Moore, "Cramming More Components Onto Integrated Circuits," *Electronics*, 38, no. 8 (1965), 114-117. Though the prediction is not explicitly made in this article, it is the foundation for the Law.

[52] The first integrated circuit was manufactured by Texas Instrument scientist Jack Kilby who submitted for patent his 'Solid Circuit' in 1959 which was later patented as US3138743 (1964), US3138747 (1964), US3261081 (1966), and US3434015 (1969).

[53] This fact was central to Michael Dertouzos' critique of Kurzweil's work in "Not By Reason Alone," *Technology Review*, 103, no. 4 (2000), 26.

[54] Kurzweil, *The Age of Spiritual Machines*, 277.

the eventual disappearance of keyboards. The present-day drive to develop increasingly unobtrusive computer displays, will lead to immersive virtual environments made possible first by ocular implants then finally brain implants.[55] This will be accomplished as the division between flesh/blood and copper/silicon becomes ever confused as one's experience of the 'real' world slowly becomes indistinguishable from one's emersion within the 'virtual' world. Subjectively it is then only a matter of making a final jump from the mind's instantiation within the physical body to the mind's instantiation within a machine.[56] This is, for Kurzweil, '*when we become software.*'[57]

Critique of Kurzweil's Speculative Science

Kurzweil, like Tipler and Moravec, appeals to the problem of human finality as the impetuous for his technological eschatology. He defends his radical hope by arguing that in light of the general antipathy towards death evidenced by the contemporary anti-death industries of medicine and life-extension, the pursuit of a final technical solution to death is simply inevitable. Thus, Kurzweil arrives at something like the 'cosmological argument' for the existence of spiritual machines: Because we need to overcome death, our technology must be able to facilitate our need. Kurzweil never doubts the ability of technology to develop to a sufficiently robust state where it can accommodate and resolve this need. Indeed, he predicts that in the 21st century, with the help of strong AI and advanced computer technology, 'the human species, along with the computational technology it created, will be able to offer succour to human needs and desires, and will be in a position to change the nature of mortality in a postbiological future.'[58]

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[55] *Ibid.*, 279.

[56] *Ibid.*, 51-4.

[57] *Ibid.*, 150. Within the computational medium, Kurzweil imagines that one's uploaded consciousness would inhabit a virtual body which despite not having any material referent, would still feel subjectively like the old physical body. Though these bodies would not exist in the physical world, unlike in either Moravec or Tipler, the virtual body would function much the same as the physical body. It would serve as a tool for navigating the environment and as a boundary between oneself and another. Kurzweil argues that just as the human body evolved to interact with the 'real' world, the virtual body would be designed to interact with its own virtual environment. See: *Ibid.*, 134, 142.

[58] *Ibid*, 2.

Thus, salvation for present humanity is to be found not in some distant eschaton, but in the move towards a posthuman and postbiological future. Whereas Tipler oriented his physical eschatology towards the Omega Point, Kurzweil's eternal kingdom fixes its gaze on the far more immanent goal of what he terms the 'singularity'. For Kurzweil, the postbiological age will reach its climax at a moment of rapid technological change which culminates in a vast dispersal of 'immortal software-based humans, and ultra-high levels of intelligence' into the whole of the cosmos travelling, 'at the speed of light.'[59] This idea resonates with both Moravec and Tipler, and signals not only the ultimate salvation of human consciousnesses, but more profoundly, the universal significance of human technology which when dispersed into the cosmos will begin rectifying even the problem of cosmic finitude, *a la* Tipler. Thus it would seem that Kurzweil's Manichean vision, like that of the other posthuman scientists discussed here, places its hope on the pure dispersal of human mind into the cosmos as the goal of evolution and the key to cosmic salvation. [60]

> I regard the freeing of the human mind from its severe physical limitations of scope and duration as the necessary next step in evolution. Evolution, in my view, represents the purpose of life. That is, the purpose of life -- and of our lives -- is to evolve.[61]

Unlike Christian eschatology, Kurzweil's immortal posthuman and postbiological future circumvents the need for the divine, by giving the individual the ultimate degree of 'power and depth' in shaping this future.[62] For Kurzweil, human technology is the medium by which human mind can be liberated from its bondage within an ever decaying body. Evolution is the means by

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[59] Ray Kurzweil, *The Law of Accelerating Returns*, [Website]·(kurzweilAI.net, 2001/04/07 [cited 30/11/2004]); available from http://www.kurzweilai.net/articles/art0134.html?printable=1.

[60] This is a theme echoed in Isaac Asimov's short story, 'The Last Question' (1956), where future computers are able to span the distance between material creation and the transcendent spirit See: Isaac Asimov, "The Last Question (1956)," in *The Complete Stories* (New York: Doubleday, 1990), 290-300.

[61] Ray Kurzweil, *Are We Becoming an Endangered Species? Technology and Ethics in the Twenty First Century: A Panel Discussion at Washington National Cathedral*·[cited 30/11/2004]); available from http://www.kurzweilai.net/meme/frame.html?main=/articles/art0358.html.

[62] Kurzweil, *The Age of Spiritual Machines*, 153.

which pure spirit is freed into the cosmos.[63] As was discussed earlier in this chapter, the Christian myth of heaven and eternal life accepts death as a means by which transformation into the eschatological reality is facilitated. Yet, the impetus behind this transformation is always figured as the active power of God. The symbol which arises from this myth is one which points to the ultimate dependence of all life (eternal or temporal) on the being and power of God, as mediated through the person and work of Christ. This critical symbolism is absent from the myths of posthuman speculative science.

For Kurzweil, Moravec and Tipler, the promise of posthuman technologies take on the theological characteristic of the messiah. Yet theirs is a messiah that is absent the double-edged sword, the mixed-messages, and the irony implicit to messiahship. The messiah comes to free, to liberate, to bring about a new era or the Kingdom of God, yet this kingdom is only realised through pain, through suffering, through death. The Christian messiah comes in subversion of the messianic hopes of Judaism, and so one must wonder if the technological messiah, in whom hope is enlisted for the sake of immortal life, is not also the bearer of destruction, exclusion and death. Ushering in the Kingdom, either theological or technological, is never unambiguous. The ambiguity of technological use necessitates the hermeneutic approach to technology advocated by this thesis.

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[63] Though *The Age of Spiritual Machines* was written over six years ago, Kurzweil still maintains his commitment to this vision of the postbiological future. In his recent work, *The Fantastic Voyage,* Kurzweil frames his futurological speculations within easily-applicable common sense health practices which are aimed at assisting the living to survive until the future day when spiritual machines are able to host human minds. The book lays out a holistic strategy of diet, weight-loss, and smart lifestyle choices that can extend human life until 'radical life-extension' technologies become available. For Kurzweil wise, 'lifestyle choices will maximise' one's ability to live long enough to 'take full advantage of the radical life-extending therapies that lie just ahead.' Ray Kurzweil and Terry Grossman, *The Fantastic Voyage: Live Long Enough to Life Forever* (New York: Rodale, 2004), 260.

The problem with Posthuman Speculative Science

The examples from posthuman speculative science discussed in this chapter can be critiqued on a variety of grounds – technical, socio-political, psychological, biological and philosophical.[64] With regards to theology, we have illustrated three principal mistakes made by posthuman speculative science: 1) a positivistic certainty in the future abilities of information technology to facilitate a techno-theological eschatology; 2) an uncritical acceptance of the myth of technology and technological progress; 3) the view that technology, as myth, can facilitate ultimate concern. The problem underlying these three principal errors is the elevation of the individual's life over and against the life of others. The belief in radical life extension within posthuman speculative science is an active denial of death which reveals what is an ultimately selfish and self-centred enterprise. As Fukuyama notes: 'A person who has not confronted suffering or death has no depth. Our ability to experience these emotions is what connects us potentially to all other human beings, both living and dead.'[65]

Technological hopes are always surface, determined, and never allowed the possibility of irreconcilable fallenness. It is the contingency of finitude, the unknowable nature of the abyss, which gives to theological narratives the depth which is so central to their character. According to Elaine Graham, posthuman thinkers pursue through technology what can be characterised as the 'technological sublime' which is rooted in a 'fear of contingency and finitude.' Though posthumanism may appear to seek after the transcendent in a manner that is akin to Christian eschatology, the posthuman agenda is always channelled through human materiality and never allowed to constructively emerge as an authentic source of hope. Rather than authentic transcendence, the futurological emphasis of posthuman speculative science is ultimately unable to escape the world within which it is situated. The attempt to engage technology in transcendental

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[64] See: Jos de Mul, "Digitally Mediated (Dis)embodiment," *Information, Communication & Society*, 6, no. 2 (2003), 247; Francis Fukuyama, *Our Posthuman Future: Consequences of the Biotechnology Revolution* (London: Profile Books, 2003), 168.

[65] Fukuyama, *Our Posthuman Future,* 173.

purposes fails to situate human technology or 'human energies' in the productive 'activity of world-building' [66]

The selfishness encouraged by posthuman speculative science reflects an uncritical philosophy of technology. The figures noted above neglect any concern for interpreting technology hermeneutically, with a concern for the broader situation of the lifeworld. The totalising and essentialising approach to technology noted here with respect to posthuman speculative sciences leads to the inauthentic theological model of posthuman techno-theology.

A return to hermeneutic realism

Something akin to a hermeneutic approach to technology has been sought after by two early detractors of Kurzweil's work. Kurzweil's position in *The Spiritual Age of Machines* was first discounted in September of 1998 when Kurzweil presented a rough sketch of his research at the *Gilder/Forbed Telecosm Conference* in Lake Tahoe, Nevada, USA. He presented his thesis in a joint panel shared with John Searle, whose objections to Kurzweil were predictably offered along the lines of his existing critique of Strong-AI.[67] Searle dismantled Kurzweil's ideas by point out the fallacy of machine based consciousness, citing his Chinese Room thought experiment. In attendance at this conference was Bill Joy, cofounder and Chief Scientist of Sun Microsystems[68]

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[66] Elaine L. Graham, *Representation of the Post/human: Monsters, Aliens and Others in Popular Culture* (Manchester: Manchester University Press, 2002), 17.

[67] Searle 's comments were later echoed in: John Searle, "I Married a Computer," *The New York Review of Books*, 46, no. 6 (1999). Hans Moravec came to Kurzweil's avail by arguing that Searle's philosophical objections to Kurzweilian posthumanism are rooted in the essential misunderstandings that separate the philosophy of mind from what Moravec terms the new 'science of mind'. See: Hans Moravec, *Letter From Hans Moravec, Carnegie Mellon University Professor, to New York Review of Books* [cited 12/12/2004]; available from http://www.kurzweiltech.com/Searle/searle_response_letter.htm.

[68] Sun Microsystems is one of the leading information technology corporations in the world. Sun is a Silicon Valley-based computer, semiconductor and software manufacturer, whose products include computer servers and workstations that based on the their own SPARC processor, the SunOS and Solaris operating systems, the NFS (network file system), and most famously the Java/Jini platform used extensively for web-based content.

who later commented that his encounter with the Kurzweil-Searle debate left him feeling strangely haunted:

> While I had heard such talk before, I had always felt sentient robots were in the realm of science fiction. But now, from someone I respected, I was hearing a strong argument that they were a near-term possibility. I was taken aback, especially given Ray's proven ability to imagine and create the future. I already knew that new technologies like genetic engineering and nanotechnology were giving us the power to remake the world, but a realistic and imminent scenario for intelligent robots surprised me.[69]

Joy's reaction reveals his heretofore uncritical appraisal of the ethical and perhaps religious import of information technology. Although aware of the potential issues associated with nanotechnology, genetic engineering, nuclear technology, and military technology; Joy confesses that until faced with the posthuman future imagined by Kurzweil, he had never considered own industry as one which was capable of the kinds of difficulties voiced in their debate. Joy's critique of Kurzweil centres on the ethical rather than practical or philosophical implications of Kurzweil's thought. He is not concerned with the material feasibility of Kurzweil's plans, his liberal application of Moore's Law, or the philosophical problems which surround the strong-AI hypothesis; rather, Joy's fears are twofold, concerning: 1) the availability of Kurzweil's radical life beyond the very wealthiest early adopters; and 2) the hubris of attempting to find technological solutions for what he regards as existential problems:

> What are the moral implications here? If we must move beyond Earth this quickly in order for the species to survive, who accepts the responsibility for the fate of those (most of us, after all) who are left behind? And even if we scatter to the stars, isn't it likely that we may take our problems with us or find, later, that they have followed us? The fate of our species on Earth and our fate in the galaxy seem inextricably linked.[70]

Joy rightly acknowledges that the re-embodiment of the human mind into some kind of spiritual machines would only resolve the one problem of human finitude, and not resolve further issues

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[69] Bill Joy, "Why the Future Doesn't Need Us," *Wired*, 8, no. 04 (2000). Journal Online. Available from http://www.wired.com/wired/archive/8.04/joy.html?pg=1&topic=&topic_set=

[70] Joy, "Why the Future Doesn't Need Us"

associated more broadly with human fallibility.[71] He rightly notes that Kurzweil falsely equates radical life-extension and an overcoming of finitude, with a reversal of all other human inadequacies. Though in theory one could live forever in a computer (barring the many philosophical and technical objections to this assertion), re-incarnation in a computer would not solve the problem of human perdition. To employ a biblical metaphor, though technology may allow us to create a new Eden, once we enter, we still suffer from the same condition that resulted in our initial expulsion from paradise. It would appear that by stepping back from the speculative hope of Kurzweil, and critically examining the situation of his claims, Joy makes the first step towards a hermeneutics of technology.

Joy advocates a self-less and self-limiting philosophy of technology, which seeks to situate human inventiveness underneath some form of governance and control.[72]

> The only realistic alternative I see is relinquishment: to limit development of the technologies that are too dangerous, by limiting our pursuit of certain kinds of knowledge....It was Nietzsche who warned us, at the end of the 19th century, not only that God is dead but that "faith in science, which after all exists undeniably, cannot owe its origin to a calculus of utility; it must have originated in spite of the fact that the disutility and dangerousness of the 'will to truth,' of 'truth at any price' is proved to it constantly." It is this further danger that we now fully face - the consequences of our truth-seeking. The truth that science seeks can certainly be considered a dangerous substitute for God if it is likely to lead to our extinction.[73]

A further critique of Kurzweil was offered by Michael Dertouzos, the late TIBCO Professor of Computer Science and Electrical Engineering at MIT.[74] For Dertouzos, no matter how advanced

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[71] For a further exploration of what I understand to be a 'Christian' understanding of fallibility, see: Paul Ricoeur, *Fallible Man*, trans. Charles A. Kelbley (New York: Fordham University Press, 1986).

[72] See also the concerns raised in: Antje Jackelen, "The Image of God As Techno Sapiens," *Zygon*, 37, no. 2 (2002), 294.

[73] Joy, "Why the Future Doesn't Need Us,"

[74] According to Dertouzos, Joy's reading of Kurzweil takes Kurzweil's futurology too seriously, and as a consequence responds to imagined rather than actual technologies. Dertouzos summarily dismisses Kurzweil's predictions, by arguing that the kind of futurological vision which Kurzweil upholds, implies a level of knowledge which is simply unattainable. This said, Dertouzos agrees with Joy

technology becomes, a denser transistor (the measure by which IT developments have been determined thus far, e.g. Moore's Law) will not allow computers to 'contribute better writings than Socrates, Descartes, or Lau Tzu...' As an alternative ethics, Dertouzos calls for all technological inventions to be couched in human need. Technological growth does not itself equal empowerment, social change, or human evolution, but rather responds to the situations raised by these conditions. It is only when technology is actualised within the context of concrete human need, can it result in some tangible human benefit.[75]

Conclusion

When technology is allowed to become the normative force by which a culture understands itself and its destiny, this culture unwittingly undermines a humanist or religious pursuit of the good. Despite claims reflecting a hope for a future improved by human technology, the posthuman ideology has more to do with a general drive towards technological conversion – bespeaking the acceptance of a technological worldview – than it does with actual physical transformation. For theology, posthumanism represents a contradicting theological model, which reinterprets the message of salvation that has traditionally been offered to humanity in other more explicitly mythological (or religious) forms. According to N. Katherine Hayles, 'People become posthuman because they think they are posthuman''[76]

Rather than denying the technologies which make posthuman rhetoric possible, society must embrace 'the possibilities of information technology without being seduced by the fantasies of unlimited power and disembodied immortality.'[77] As such, the place of technology must be

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that technology needs to be developed in connection with a concern for humanist values. Michael Dertouzos, "Not By Reason Alone," *Technology Review*, 103, no. 4 (2000), 26.

[75] It is worth noting that Dertouzos and Joy's critiques of Kurzweil did not go unnoticed. If there is one thing that I have learned in the three years that I have been studying Kurzweil, it is that he tenaciously monitors the dialogues surrounding his theories. Proof of this is found readily enough on his website (www.kurzweilAI.net), which contains 'responses' to nearly every critique that has been levied against his futurological writings.

[76] N. Katherine Hayles, *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature and Informatics* (Chicago: The University of Chicago Press, 1999), 6.

[77] *Ibid.*, 5.

grounded in life lived in community and governed by shard narratives and common values. The posthuman drive to undermine finitude as a defining characteristic of human life undermines present humanity for the sake of a distant posthumanity.

For theology, a productive engagement with technology starts by a move away from the blind faith of the posthuman myth of unceasing technological progress, and a move towards a hermeneutics of technology that centres on a concern for a technology's appropriateness. This indicates a transition away from the techno-theology of IT culture towards a theology of technology which roots technology in the symbols of faith, with a keen awareness of human fallenness. In conclusion, it is to this aspiration that this thesis now turns.

Conclusion: Sketches towards a Theology of Technology

I believe that God has created me together with all creatures. God has given me and still preserves my body and soul: eyes, ears, and all limbs and senses; reason and all mental faculties. In addition, God daily and abundantly provides shoes and clothing, food and drink, house and farm, spouse and children, fields, livestock, and all property—along with all the necessities and nourishment for this body and life. God protects me against all danger, and shields and preserves me from all evil. All this is done out of pure, fatherly, and divine goodness and mercy, without any merit or worthiness of mine at all![1]

This thesis has argued that the culture surrounding information technology conveys an inauthentic theological model, called here a techno-theology. In contrast to a theology of technology which seeks to ground the cultural appropriation of technology under the norm of the Christian *kerygma*, a techno-theology approaches technology as an object that conveys ultimate concern. The inauthentic theological model that is proffered by techno-theology is facilitated by two philosophical misunderstandings, which have been described in this thesis as technological essentialism and cybernetic totalism. This argument has been supported on two fronts, represented by the two sections to the thesis.

In the first section, the philosophical, historical and material situation of contemporary information technology was explored, noting the tension between a realist and idealist reading of information technology, and the shortcomings of centring exclusively on either pole. The section began by noting in chapter one the historical antecedents to contemporary philosophies of technology. In chapter two we discussed technological essentialism by tracing its developments through the so-called Prosthetic School (Kapp, Marx and Dessauer) to the fully formed essentialism of Heidegger, Ellul and Borgmann. Essentialism, it was claimed, prohibits a theological critique of technology by limiting the possibility of redemption. In chapter three a solution to essentialism was offered in the form of a hermeneutics of technology, which approaches the ambiguity of technical acts, seeks to situate technology within the broader lifeworld, and leaves open the possibility of constructive critique.

Chapter four sought to follow the hermeneutic approach to technology by appealing to the historical and material situation of information technology, and by offering a realist critique of

[1] Martin Luther, *Small Catechism*, part 2: the creed

information technology from the perspective of cybernetics. Chapter five noted the trend within contemporary theology, cognitive science and artificial intelligence research to eschew a hermeneutical approach, and teased out the negative implications of the idealised interpretation of technologies offered in these subject-areas. Specifically, chapter five discussed the problem of cybernetic totalism.

Because the culture surrounding IT is inclusive of both actual material technologies and their effect upon society, and imagined or speculative technologies and their affect upon technology's users, the second section of this thesis sought to note how IT's place within fiction and speculative science contributed to posthuman discourse. Posthuman discourse is at the heart of what this thesis has described as the implied techno-theology of IT culture. In chapter six, posthumanism was defined as a belief in a technology-human co-evolution which would lead to the eventual perfection of future humanity and the conquest of human finitude. The techno-theological eschatology of posthuman thought views IT as the purveyor of ultimate significance. However, it was noted in chapter seven that posthuman fiction can be used to problematise the certainty of posthuman theory and speculative science, by allowing the myths told about technology to give rise to the application of fictive technologies as a vehicle for social critique. The end of chapter seven touched on the abuse of fiction at the hands of cyborg-feminism and critical theory, which failed to read within science fiction literature and film what is natively a valid and poignant critique of contemporary technology culture. Lastly, in chapter eight we explored the explicit techno-theology of posthuman speculative science which was evidenced by its uncritical acceptance of technology as an object of techno-theological significance.

Now that we have explored the full breadth of IT's culture, discovered its material, historical, imagined and speculated situation, argued against its faulty philosophical predispositions, and advanced various means of rectifying its inadequacies, the conclusion of this thesis will make a few parting comments regarding the need for a theology of technology. In sum, a theology of technology must take as foundational a fivefold call: a call to the doctrine of creation and redemption; a call to kerygma, a call to self-reflection, a call to imagination, and a call to control.

A Return to Creation and Redemption

As its central tenet, posthumanism upholds a belief in human perfectibility that can be facilitated by human technical means. Technology, within the techno-theology of posthumanism, is seen as a co-emergent property of human evolution and is regarded to be the means by which this perfection can be achieved. A theology of technology must address the limits of human creativity and seek to subsume this creativity underneath the norm of the Christian *kerygma.* To this end, we shall take as normative an understanding of the human-divine relationship that is characterised by the role of the Divine as the creator and the role of the human as the created. Creativity, in the theological sense of creation, always implies a relationship between the creator and the created which points beyond the myth of creation (as a point of origin) towards the symbol of the creation (as an existential foundation).

Human creativity is an echo of the divine creative act. If interpreted as a form of theological practice, human creativity can be seen as a memorial of the drama of creation and redemption, framing human action within the context of salvation history. So doing places technical creativity along the continuum of human fallenness and the graciously offered promise of redemption. A theology of technology encourages an ethics of technological practice which promotes the use and creation of technologies to serve the ends of this kerygmatic re-narration of technique. A theology of technology ever places as a mark over human creativity the limitations and destinies of created human beings. By contrast, the posthuman techno-theology disregards fallenness and seeks to usurp the divine origins of redemption, allowing technology itself to be the foundation and ground of human becoming.

A Return to the Kerygma

In this thesis I have chosen to partner *kerygmatic* theology with my critique of information technology. In the introduction I eschewed a definition of the *kerygma* as preaching for a definition of the *kerygma* as presence. The *kerygma* points to the presence of divine transcendence within the context of human immanence. It alludes to the possibility of divine redemption as spoken into the individual's situation in the world. Furthermore, the *kerygma* is both deeply immanent to the world and has as its source and telos the divine Word. It is a sign of God's

transcendence and God's condescension.[2] Because a *kerygmatic* theology is based in transcendence and actualised in immanence, the *kerygma* prevents humanity from searching for the full actualisation of the Divine being within the world. It is the antidote to both pure pantheistic immanentism and deistic transcendentalism 'God does not correspond to our image of him,' says Thielicke, 'transcendence cannot be objectified...the ground of reality does not have the form of reality.'[3] My choice in placing a theology of the proclamatory *kerygma* against a techno-theology of information was not unintentional.

One can contrast the *kerygma*'s richness of meaning with the meaning-deficiency of information. Claude Shannon's definition of information rejects that the study of information has anything to do with semantics or relevance, noting, 'These semantic aspects of communication are irrelevant to the engineering problem.'[4] In contrast, the *kerygma* represents the transformative and redemptive presence of the Divine in the particular affairs of the human situation. The proclamation of the *kerygma* is a re-speaking of that original creative word which brought meaning to the primordial chaos described in the Genesis creation myth. A fundamental problem that was identified with the role played by information technology (within the techno-theology of IT culture) was the use of IT as a hope-filled symbol that was in excess of its realistic interpretations. In contrast to the historical-material analysis of IT in chapter four or the hermeneutic approach to technology in chapter three, the idealism described in chapter five and the speculation described in chapter eight invests IT with significance that exceeds its intended use. Within techno-theology it is IT that is elevated to the point of ultimate concern. For a *kerygmatic* theology, ultimate concern is announced by the *kerygma* but still retains its transcendent characteristic apart from the *kerygma*.

The usefulness of a *kerygmatic* theology to dialogue with the techno-theology that has been discussed in this thesis appears in an analysis of hope. Does one put one's hope in human

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[2] Helmut Thielicke, 'Outline of the Task of Proclamation', *The Evangelical Faith,* Vol. 1 (Grand Rapids: Eerdmans, 1974), 378 in Ray S. Anderson, ed., *Theological Foundations for Ministry* (Edinburgh: T & T Clark, 1999), 625.

[3] *Ibid.,* 627.

[4] Claude Shannon, "Communication Theory of Secrecy Systems," *Bell System Technical Journal*, 28, no. 4 (1949), 656.

technology or in something other? Is IT able to cash the cheques that techno-theology writes? In Moltmann's early theological anthropology he describes how humans create technology in order to create a world of meaning out from the chaos of nature. Although through technology humanity has technology been released from the 'uncomprehended powers of nature, man comes at once into a new dependence upon his own works and organisation.'[5] As was described by Tillich in his 'Technical Society as Symbol'[6], Moltmann notes that the powers of control which have been divested from nature are subsequently reinvested in human technical abilities. As such, human technologies transition from controlling nature to controlling humanity itself. Living in an over-controlled world, humanity must find some escape from the tyranny of pure immanence. Yet, hope in the time of the industrial age is often sought in the very technologies which in their use strip the individual of freedom. The problem identified by Moltmann is the myth of technical progress which is 'regarded as identical with human progress.'[7] To attain freedom from technology, humanity mistakenly pursues freedom through technology. He notes, 'up till now...it looks as if everyone is busily shovelling the coals of progress into the locomotive of society, without knowing who is in fact driving the locomotive, and where it should be going to.'[8]

Moltmann sees endemic to the rhetoric of progress an implicit secular eschatology that manifests itself as a hope for 'a kingdom of prosperity, peace, and dominion which could be accomplished on earth.'[9] Technologies are seen to possess a kind of anticipatory promise. They signal liberation from both the sense of over control and the lack of meaning. In the use of technologies, as bearers of myth, hope is stirred in the hearts of technology's inventors and users. Moltmann notes that in the use of technology we proclaim a techno-eschatology which usurps any image of a Christian eschatology. 'As the heavenly city of God, according to the old prophecy, has

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[5] Jurgen Moltmann, *Man: Christian Anthropology in the Conflicts of the Present* (London: SPCK, 1971), 23

[6] Paul Tillich, "The Technical Society As Symbol (1928)," in *The Spiritual Situation of our Technical Society* ed. J. Mark Thomas (Macon, Ga.: Mercer, 1988), 179-84.

[7] Moltmann, *Man,* 25

[8] *Ibid.*

[9] *Ibid.*, 29.

no temple, so the modern megalopolis is already religionless and is inhabited by men come of age. This is the language of the Christian chiliasm of the new age.'[10]

How then is Christianity to respond to the eschatological promises of a technological age? It is through a *kerygmatic* theology and its proclamation of the crucified God that a theology of technology may begin to find its object of hope over and against the hope that is invested in contemporary technical prowess.

> The basis of Christian hope lies in faith in the *crucified* Son of Man. It is in him that the wholly other kingdom of God has set foot on earth. It is therefore 'hidden under the cross' (Luther) , and becomes present only during temptation and in struggle. Following the crucified Jesus creates the distance of Christians from this passing world, which one can only have 'as if one had it not '(I Cor. 7.29). The following of the crucified Jesus however also creates the strength for the incarnation of love in those possibilities which one has or finds. This love grips this life as if it were everything, and yet at the same time knows that that which is is not all there is. It denies itself and passionately as if with death everything were over, and yet it hopes in the resurrection of the dead. It finds God in the concrete, and yet it knows that everything concrete is transcended by God.[11]

The presence of this hope is found in the *kerygma*, through faith in the concrete yet transcendent eschatological promises of God. The *kerygma* offers to reorient the object of hope away from human technology towards the eschatological divine reality. It liberates technologies from functioning in excess of their intended aims, and realigns technology in the service of the good.

A Return to Self-reflection

A theology of technology is a call to reflection. It places the created subject within the context of the world, and asks the subject to self-reflexively analyse the nature of his/her engagement with the created order. It provides an alternative theological model to the certainty of a techno-theology, by inviting the subject to participate in the co-creative activity of world re-narration. Whereas a theology of technology invites participation, a techno-theology bids the subject to conform to the image of the world imposed by technological ideals.

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[10] *Ibid.*, 30.

[11] *Ibid.*, 44-5

Techno-theology, by regarding human technology as the means by which one discovers ultimate concern and by making technology the foundation for human becoming, obscures the subject within its discourse. Human culture becomes subservient to human technical production and the drive of technique. A theology of technology elevates the depressed subject out-from a technologically determined milieu and encourages the subject to self-reflexively evaluate her relationship to human creativity. Taking the *kerygma* as normative for our engagement with material culture, the theology of technology challenges the subject to perceive the technological world from her stance within theological community. Technology is denuded of its mythic import, and regarded as an object amongst other objects, sharing in the fallenness and finitude of all creation. Instead of positing a subject who casts the self through technological mediation, making human technical capacity the beginning and end of history, a theology of technology situates the subject within the context of salvation history, allowing the story of creation, fall, redemption and consummation to be the locus for identity, community and creativity.

A Return to Imagination

In the analysis of posthuman discourse, it was suggested that the fictive imagination discussed in chapter seven was preferable to the certainty that was implied in the examples from speculative science in chapter eight. The term 'speculative science' was used to refer to a form of scientific reflection where the future of scientific discovery is the primary object. This may have sounded like 'science fiction', but I carefully differentiated between the role played by imagination within science fiction and the role played by speculation within speculative science. The imagination in science fiction is patently fictive, and is employed primarily for the purpose of entertainment, though it can be regarded as a form of social critique. The object of science fiction is neither real technologies nor a real future. Its relative freedom from factuality allows the fictive imagination to bring the present-day reader into contact with an alternative future or alternative present whereby, through an encounter with the uncanny, ethical reflection may proceed.

By contrast, speculation, at least in the way in which the term is employed in posthuman speculative science, is grounded in a familiarity with the present which projects onto the future an informed guess of what *could* be in light of what *is*. Speculative science grounds its future on the

trajectory that is set by the present. It represents an unwavering faith in the myth of progress, looks to the future for its ultimate goal, and in so doing, views the present only in terms of its ability to procure this future goal.

A theology of technology finds resources in the imaginative worlds of science fiction as distinct from the certainty endemic to speculative science. Science fiction offers a means of creative reinterpretation of technology, and challenges the contemporary technology user to re-evaluate his or her capitulation to a technological world. The fictive imagination calls for a similar kind of hermeneutic re-narration which is advanced by a theology of technology, in seeking to place the *kerygma* as the hermeneutic norm used in the appropriation of technology. Science fiction encourages the same kind of self-reflexive turn as that in theology, by challenging those emerged in passive technology habituation to critically regard technology as a product of human creativity and not as the source of cultural value.

A Return to Control

Lastly, a theology of technology must promote a form of control over technology which orients human technical production and use towards a goal or goals which transcend the teleology of technology itself. This is a return to a more *poiesis* informed reading of technology, which regards the appropriateness of technology to be a function of a technology's ends. A theology of technology must seek to direct technology-use towards that which is appropriate rather than that which is expedient, or possible, or most financially rewarding. This is the essence of Wiener's critique of cybernetic technologies as advanced in chapter four. Wiener called for cybernetic networks to be limited by external governances which control the shape and direction of cybernetic research and development. As was intimated at the end of chapter seven and described more fully in chapter eight, the idea of external control which marshals developments in technology is absent from the techno-theological ambitions of posthuman theory and speculative science. Posthuman techno-theology allows technology to be perceived as an essential foundation to contemporary human culture. As essential to human being it can receive no substantive critique from culture as it is itself tantamount to human culture. Furthermore, for network theory, the complexity of the random network becomes the mystical foundation from which meaning is argued to emerge. Both

complexity theory's dependence upon the meaning-bearing randomness of an uncontrolled network, or posthuman discourse's insistence upon the essential beneficence of human technical creativity, denies the notion of external governance or control of human technologies.

A theology of technology must advocate for the rights of the individual and his or her culture which use and are used by human technology. It must posit norms by which technology can be judged as appropriate or inappropriate, and thereby control the direction of technology to reflect genuine human need. It must allow meaning to emerge from outside the totalising complexity of the network, seeking meaning outside of (and within) human creativity. Technology, when itself the norm and locus of human meaning, can facilitate the gradual destruction of the subject and the culture which employs it as its foundation. A theology of technology curtails this reifying tendency by drawing human technical ability into a relationship with divine creativity, encouraging the subject to self-reflexively evaluate his or her engagement with technology, and by advancing an ethics of technological practice which marshals human creativity through external norms based in culturally determined strong values. It is here that technology and theology, through post-critical correlation, can aspire towards a redemption of human material culture.

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