You shall love your neighbor as yourself:

Ethics of Artificial Intelligence, Robotics and Supra-Intelligence

by

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Duke Divinity School
Duke University

Date: ___4/24/2020_______
Approved:

Samuel Wells, Supervisor

Luke Bretherton, Second Reader

Will Willimon, D.Min. Director

Thesis submitted in partial fulfillment of the requirements for the degree of Doctor of Ministry in Duke Divinity School of Duke University

2020
ABSTRACT

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Fascination with automation has captured the human imagination for thousands of years. As far back as 800 CE, when Baghdad was at its height as one of the world’s most cultured cities, its House of Wisdom produced a remarkable text, “The Book of Ingenious Devices.” In it were beautiful schematic drawings of machines years ahead of anything in Europe—clocks, hydraulic instruments, even a water-powered organ with swappable pin-cylinders that was effectively a programmable device.

The fascination with automation has come a long way since then. Technological advancements in the last seventy years have provided unprecedented opportunities for humans to explore not only automation, but now also the creation of intelligent and superintelligent machines. These machines promise to mimic human qualities and even supersede humanity in every manner of task and intelligence. The explosion of, and ready access to, information through the internet has proved to be challenging in some regards but has also eased other aspects of life. An example of this would be the way long-lost friends can be reunited through the click of a mouse. Similarly, news accompanied by pictures and videos is now readily available in real-time. These conveniences have also brought unintended consequences. Despite this newfound
connectivity, social challenges such as loneliness and suicide are on the rise. Technology has also opened the door to problems such as cyberbullying, election manipulation, and fake news. Information, whether it be accurate or not, spreads across the world at unprecedented speeds, carrying with it change, sometimes for the better, but not always. This is all happening before the anticipated age of superintelligence.

This thesis examines the distinct nature of humanity and God in view of the emergence of superintelligence. Can we see this “new creation” as an addition to God’s creation of humans, angels, and Satan? If that be the case, then questions of ethics and theology need to be addressed. For instance, who gets to program these new superintelligent “beings?” As things stand today, the individuals and corporations with the deepest pockets are racing to be the first to produce superintelligent beings. The so-called “technology horse” has already bolted, with government policy struggling to keep up. Unseen in this race is the prophetic and ethical voice of the church, regarding the meaning of life, and what living in this new reality will look like.

More questions are raised than can be answered in this paper. How does the Church stay true to its message of hope in a world where robots will likely take over everyday jobs? Where will humanity find meaning and contentment? What are we to think about the idea of a basic universal wage? How will such a shift impact migrant and the poor?
In this paper I establish a framework for the church to consider different aspects of these challenges, even as people are welcomed weekly into the community of faith.

This thesis represents extensive research into the philosophy and practice of safety engineering, paired with personal experiences as a professional in the technology industry who is also deeply committed to being a disciple of Christ. Primary works I have drawn from extensively include Hauerwas and Wells’ Blackwell Companion to Christian Ethics, and Jungian archetypes in comparing and contrasting biological beings to technological creations. The paper starts with creation accounts from Genesis and the Enuma Elish as a way of exploring the “being” category as it appears on this planet.

Personal insights gained working in both enterprise and startup businesses, as well as in my own professional development, have contributed to this work and may be found throughout. This thesis represents a labor of love through which I have learned a great deal about my own profession and faith. However, it is my sincere hope that it will be much more. Through this dissertation I hope to see companies both big and small taking note of the ethical issues discussed here, even as they find themselves unleashing artificial intelligence in the marketplace. At the same time, I expect churches and religious organizations will benefit from this discussion and will, I hope, move to engage more deeply with culture and the marketplace as new opportunities and risks emerge from the implementation of artificial intelligence. If the observations that I have
made and the recommendations that I have set forth can inspire even one person to carefully examine his or her identity in Christ, then this work will be successful beyond its original purpose as an academic work.
Dedication

To

my mother, Sarala D. Kasbe

who instilled value for education and provision
Contents

Abstract .......................................................................................................................................... iv

Dedication ................................................................................................................................... viii

Contents ......................................................................................................................................... ix

List of Figures ............................................................................................................................... xii

Acknowledgements ................................................................................................................... xiii

1. Myths, fictions and stories in human and AI creation ......................................................... 1

1.1 The Genesis account of creation ............................................................................................ 2

1.2 Sumerian creation myth ........................................................................................................ 4

1.3 Egyptian creation myth ........................................................................................................ 10

1.4 Mary Shelley’s Frankenstein ................................................................................................ 12

1.4.1 Rossum’s Universal Robots ............................................................................................... 14

1.4.2 Isaac Asimov and Murray Leinster .................................................................................. 15

1.5 Ethical lessons from the creation of humans and robotic fiction........................................ 17

1.5.1 Community and relationship ............................................................................................ 17

1.5.2 State of the human heart .................................................................................................... 21

1.5.3 Boundlessness of God ........................................................................................................ 24

1.6 Pierre Teilhard de Chardin’s noosphere ............................................................................ 25

2. Artificial intelligence and the Imago Dei ........................................................................... 30

2.1 Background and definitions ................................................................................................. 36
2.1.1 Computer programming ................................................................. 37
2.1.2 Artificial Intelligence ................................................................. 38
2.1.3 Superintelligence ................................................................. 38
2.2 Current progress of AI ................................................................. 40
2.3 Imago Dei ................................................................................. 46
  2.3.1 Positive or liberating meanings of the Imago Dei ................. 47
  2.3.2 Unintended meanings and consequences of the Imago Dei .... 57
3. AI and life forms ........................................................................... 61
  3.1 Soil and Silicon (Si) ................................................................. 62
  3.2 From soil to cyborg? ................................................................. 73
  3.3 Breath of God ........................................................................... 80
  3.4 Morality in body or in soul? ....................................................... 83
4. Implications of AI on our planet and society ............................ 92
  4.1 Economic implications ............................................................. 98
  4.2 Political implications ............................................................... 105
  4.3 Theological and ethical implications ......................................... 116
5. AI and the Church ........................................................................ 124
  5.1 AI and ethics ............................................................................ 125
  5.2 Practical suggestions ............................................................... 133
    5.2.1 Revisiting Frankenstein ....................................................... 134
    5.2.2 Rediscover the scientific roots of the reformation .............. 141
5.2.3 Move the discussion from the front of the Bible to the middle of the Bible .......... 147
5.2.4 Promoting a positive and mindful approach to AI ..................................................... 152
5.2.5 Nimbleness ........................................................................................................................ 156

Appendix A ................................................................................................................................ 160

Appendix B .................................................................................................................................. 162

Appendix C ................................................................................................................................ 166

Appendix D ................................................................................................................................ 167

Bibliography ............................................................................................................................... 168

Biography .................................................................................................................................... 197
List of Figures

Figure 2-1: Heidegger’s unification of Aristotle’s causes .......................................................... 31
Figure 2-2: Russell and Norvig’s Four Forms of Artificial Achievement .............................. 42
Figure 2-3: Wenham’s Questions Surrounding the Imago Dei 89 ............................................. 48
Figure 3-1: Brain Implant Electrode - Photo by Dan Winters ................................................ 77
Figure 3-2: Electrode Implant - Illustration by Francesco Muzzi .......................................... 78
Figure 3-3: Phineas Cage’s Iron Rod Injury .............................................................................. 84
Figure 4-1: Fangman worth more than France and UK combined, December 2019 .......... 104
Figure 4-2: Political Chatter Diagram .................................................................................... 110
Figure 5-1: Ethical Principles Identified in Existing AI Guidelines ..................................... 128
Figure 5-2: Introduction of Technology and Ethics with Resultant Chaos ......................... 134
Acknowledgements

First and foremost, I would like to thank God for enabling me to complete this work. I want to thank him for wisdom, knowledge, strength, ability, and opportunity to undertake this study, and to persevere and complete it satisfactorily. Without His grace, this achievement would not be possible.

I especially want to thank my supervisor, Samuel Wells, for not only his guidance during my research and study at Duke Divinity School, but also for encouraging me to embark on this study in the first place. I am privileged to have Luke Bretherton as my second reader. And, valued the interaction we had as this dissertation unfolded. His knowledge of theological anthropology was impressive, encouraging, and incredibly helpful.

I am grateful to my family for their love and support throughout my life. This study simply would not have been possible without them. The time spent away for my residency and the time we were apart because of the war in Russia is a testament to their commitment to me and my growth.

I would like to acknowledge my colleagues at Intrexon Corporation (now Precigen, Inc.). R.J. Kirk, previous chairman and CEO of Intrexon, and I were the only people at Intrexon back in 2011 who had not yet completed our doctoral studies. I took this as a challenge and studied further and in so doing, joined the cadre of doctorates at
Intrexon (even though it’s a different kind). I want to thank R.J. for his encouragement throughout this project.

For my parents, knowledge was a sort of currency. Their dreams for me to “never stop learning” resulted in this achievement. Without their loving upbringing and nurturing, I would not be where I am today, and I would not be the person I am today. My dreams of excelling in my study of theology and technology would have remained mere dreams had it not been for my parents’ unflinching insistence and support. I thank my father with all my heart. He is my ultimate cheerleader and encourager. I know that he is proud of me, having been born and brought up in a dusty village in India, now traversing the boardrooms of Fortune 50 companies. I wish him a long life filled with much work. Even though my mother passed away last year, I know she continued to look over me and send her blessings. She truly is my guardian angel.

I would also like to thank my dear friends (too many to list here) who have continued to be by my side as I walked this doctoral journey through to the completion of my thesis. I want to thank them for putting up with me in difficult moments when I felt disheartened and confused, and for always encouraging me to follow my dream of getting this degree. This would not have been possible without their unwavering and unselfish support given to me at all times. Ralph Du Plessis has been my soulmate
throughout this project, and without his constant nudging, this thesis would simply not have happened.
1. Myths, fictions and stories in human and AI creation

Stories have significance. Stories link their message with humans’ moral code, and the moral code has implications on behavior. Details of these stories vary from culture to culture, but the moral code underneath the story more or less remains consistent across cultures. For example, it is considered wrong to commit genocide or kill hundreds of people using automatic and semi-automatic weapons. The story about how the killing was done may differ from culture to culture, but the moral code beneath it is common. The creation of both human intelligence and artificial intelligence are borne out of stories, be they millennia-old accounts in the biblical narrative of Genesis, the Sumerian epic of Enuma Elish, the Egyptian Ennead, or recent writings that depict the creation of artificial intelligence, as in Mary’s Shelley’s *Frankenstein* or Karl Capek’s *Rossum’s Universal Robots*.\(^1\) Their mythologies convey to us stories of transformation. In the case of *Frankenstein* and *Rossum’s Universal Robots*, artificial intelligence was nonexistent. But looking back, they stand out as prophetic in the face of the robots we now experience every day. I will examine the contents of these stories, with the aim of

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drawing out the moral implications with which they present us, highlighting their cultural significance then and now.

1.1 The Genesis account of creation

“In the beginning when God created the heavens and the earth, the earth was a formless void and darkness covered the face of the deep, while a wind from God swept over the face of the waters. Then God said, “Let there be light”; and there was light. And God saw that the light was good; and God separated the light from the darkness. God called the light Day, and the darkness he called Night. And there was evening and there was morning, the first day,” (Gen. 1:1–5, NRSV).

In these few verses, at the beginning of Genesis, we are confronted with two conflicting ideas: chaos and *logos*. Chaos represents formlessness, emptiness, and darkness. By contrast, God’s word, the spoken word, represents *logos*, logic, and rationality, which creates order: “‘Let there be light’; and there was light.” (v.3) The separation of light from darkness, one led by unconsciousness and the other by consciousness, are both necessary and prerequisite to produce a being. The word of God creates order out of chaos.² There is a direct connection between the word of God and Jesus Christ. In John 1:1-5 we read:

“In the beginning was the Word, and the Word was with God, and the Word was God. He was in the beginning with God. All things came into being through him, and without him not one thing came into being. What has come into being in him was life, and the life was the light of all people. The light shines in the darkness, and the darkness did not overcome it.”

Christ is the order-maker out of chaos, the chaos of sin that causes darkness within the human heart. He dies for his enemies, to save them from the certain death that awaits all creation. The story of creation is a story of transformation from darkness into light and from chaos into order, establishing a livable order of biological intelligence. The most distinctive feature in the creation account is the creation of humanity in the image of God, as described in Genesis 1:26-27:

“Then God said, ‘Let us make humankind in our image, according to our likeness; and let them have dominion over the fish of the sea, and over the birds of the air, and over the cattle, and over all the wild animals of the earth, and over every creeping thing that creeps upon the earth.’ So, God created humankind in his image, in the image of God he created them; male and female he created them.”

In the creation account of humanity, biological intelligence is seen as partaking directly in the nature and character of the deity. For example, in Genesis 1, God names the creation; by contrast in Genesis 2, Adam names the creation. In the same way the cosmos rises out of darkness and chaos, humanity is not only of the deity, but also dependent on it for its operation. Thousands of years later, the early church would sing, “For ‘In him we live and move and have our being’; as even some of your own poets have said, ‘For we too are his offspring,’” (Acts 17:28). The oneness of God and humanity as an implication of the order-making in a chaotic world is a continual process, even as the church confronts factions and racism within its body (cf. 1 Corinthians 12:13; Colossians 3:28; Galatians 3:28).
1.2 Sumerian creation myth

Scholars predicate the creation account in Genesis on earlier writings. An older story that is commonly discussed is the Sumerian account of creation in the Enuma Elish myth, dating back some five thousand years. In this account of creation, the political structure of the Sumerian culture is directly linked to the myth. For example, the emperor is the direct representation of the highest God in the Mesopotamian pantheon—Marduk. This representation gave the emperor sovereignty, which was used to avert revolutions in the community.

The Enuma Elish starts with Tiamat, the female representation of chaos, at the bottom of the ocean. Water is an essential element in this primordial thinking and can be linked to what we now know about the human body. Over ninety percent of the human body is comprised of water. Seventy-three percent of the human brain, the seat of biological intelligence, is water. The sun also comes into the picture, presented in the myth as the source of all energy known to our universe. Tiamat is locked in a sexual embrace with her husband Apsu, in an egg-like state, presenting an indistinguishable

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yet beautiful picture of the unity between male and female. Together they produce a sense of the creation, creating a new form of being. This results in the initial creation of beings that led to the dominion of the elder gods. These elder gods create havoc and cause winds, which end up rousing Tiamat. There is a sense that any form of activity is likely to threaten a catastrophe. Even attempting to solve problems could result in the emergence of a multitude of new problems, much like the hydra, the serpentine monster that keeps growing new heads as its old ones are chopped off. Humans’ frenetic activity, per the Enuma Elish, alters the cosmos, which could result in the destruction of nature itself, the complete annihilation of humanity and creation. In today’s postmodern world, we live with this daily fear, that our frenetic activity will alter the cosmos in a way that will destroy both nature and us. This is a classic Sumerian fear.

This primordial dominion of the gods is not one of logical and rational beings like that of humans. The gods cause a racket around the world and disturb Tiamat, the symbol of chaos. She decides to wipe them out. While Tiamat is fuming at the bottom of the ocean, the gods overstep their realm and end up killing Apsu, the representation of order, logic, culture, and rationality. The gods go so far as to destroy culture itself. That which gave rise to the gods ends up killing them. The destruction of culture results in grave, unintended consequences, parallel to the Sumerian myth. Tiamat destroys the

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world, reverting it back to its primordial, non-existent state. The gods know that Tiamat
can wipe them out in a matter of seconds. Generations later they produce a grandson,
Marduk. When Marduk’s father sees him, this is what he observes (Enuma Elish, 90-
103):

81  In Apsû was Marduk born,
82  In pure Apsû was Marduk born.
83  Ea his father begat him,
84  Damkina his mother bore him.
85  He sucked the breasts of goddesses,
86  A nurse reared him and filled him with terror.
87  His figure was well developed, the glance of his eyes was dazzling,
88  His growth was manly, he was mighty from the beginning.
89  Anu, his father's begetter, saw him,
90  He exulted and smiled; his heart filled with joy.
91  Anu rendered him perfect: his divinity was remarkable,
92  And he became very lofty, excelling them in his attributes.
93  His members were incomprehensibly wonderful,
94  Incapable of being grasped with the mind, hard even to look on.
95  Four were his eyes, four his ears,
96  Flame shot forth as he moved his lips.
97  His four ears grew large,
98  And his eyes likewise took in everything.
99  His figure was lofty and superior in comparison with the gods,
100  His limbs were surpassing, his nature was superior.
101  'Mari-utu, Mari-utu,
102  The Son, the Sun-god, the Sun-god of the gods.'
103  He was clothed with the aura of the Ten Gods, so exalted was his strength,

In line 99 above we read the first indication that Marduk represents something
elevated compared to the primordial deity. Marduk is the offspring of the gods. He
represents heightened awareness, with four large ears and four eyes. His status
surpasses that of his forefathers; when he speaks, fire spurts out; there is power in his
speech. He is also associated with the sun, the consciousness. When the sun rises, the
day begins. According to the sun/solar myth, he is a deity of cyclical nature, in line with
the cyclical nature of the sun (rising and setting). Just as Tiamat is about to wipe out all
the gods, in Marduk a hero is born. The crisis, the unknown, the fear, the panic, the
nerves, the destabilizing forces beckon the arrival of this necessary hero. Many
interpretations are made of Marduk, but the one that makes sense here is the one that
deals with the human condition. We are born in pain, and a child undergoes emotions of
fear, panic, and lack of confidence. As that child grows through into his twenties and
thirties, a single force needs to bring all these negative and dark emotions under control.
The Sumerian author is as much doing psychology here as dealing with the undisputed
dominion of the elder gods (instincts). The question, then, is, “Who should rule?” What
becomes the governing rule? How are values built? The Mesopotamians, the first great
civilization, needed to bring hundreds of tribes into a single, integrated order. How is
this all represented? Marduk is elected king and prepared for battle having been given
irresistible weapons. Marduk confronts Tiamat and binds her in a net. The net
powerfully symbolizes wisdom, in the sense that when humans face the unknown, they
engulf themselves in the explanatory network of that unknown. They give the unknown
a substantial form, versus fighting out of it. Marduk’s name is also “Who accomplished
clever things in the battle with Tia-mat.” (Tablet VII:116). Marduk cuts Tiamat into pieces, and out of them makes the world.

The Sumerians are providing a metaphor where Marduk represents the one who can use calamity to fashion the world. This story of human civilization speaks of using our creative genius to make a world out of the unknown. Embodiment of the logos is precisely that which Marduk represents in the Sumerian epic: the human capacity to redeem the world. These myths may not be believed any more, but their principles sit at the basis of Western society and how humanity survives, thrives, and enjoys this world.

Once a year the Sumerians would take their king outside the city to a place considered unsafe. There the priest would take away all the king’s status symbols, strike him, and then force King Marduk to confess all his shortcomings and sins. This served as a means of “recharging” at the start of the new year, bringing fresh perspective and action which aligned with Marduk. If this was not done the kingdom could be lost. Marduk then reenacted his fight with Tiamat, after which he was locked up with a prostitute for the purposes of procreation, so that something new could be made. It has been noted that the idea of New Year’s resolutions may be rooted in this archaic

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Sumerian tradition. In any case, the tradition of installing someone into power served as a healthy yearly reminder that authority ultimately implied accountability to the people.

In the ancient stories and myths, these representations of gods function as what the postmodern world would describe as motivational forces. For example, the warrior god is one filled with rage, whereas Venus represents motives of love, sex, and passion. Stimuli have the ability to unleash power to behave in a certain way. Notions of deity meant stimuli or motivational forces. Freud’s fundamental motivational levels could be called gods or deities in the ancient narratives. Many times, such motivational forces are beyond explicit explanations. A recent study shows mice will not mate with other mice that have rH factors closer to their own. Another study in humans resulted in a similar finding: women will generally avoid men that have rH factors close to their own. Emotional and motivational systems are programmed in humans on a far deeper level than is known at a conscious level, which is known to control our behavior voluntarily. When one is gripped with fear, there is no way of responding to it. Psychologists call

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this “generalized inhibition”. These motivational forces (or deities) are deeply programmed into humans and activated at the appropriate time. After many thousands of years, science is only now proving that these myths and stories motivate the behavior systems intertwined in humans. 

1.3 Egyptian creation myth

The Egyptian myth, the Ennead, which brings together nine different and often conflicting stories, also has a clear account of fertility and order to balance out chaos. Geb and Nut give birth to Osiris and Isis, and to Set and Nephthys, who become couples. Osiris and Isis represent fertility and order, while Set and Nephthys represent chaos, balancing out Osiris and Isis. The uniqueness of this myth is that it was revealed at the dawn of civilization, as opposed to developing over hundreds of years like the Enuma Elish and the biblical account in the book of Genesis. Much like Romulus in Rome, Osiris founded Egypt and mythologically represented all the pharaohs and leaders of the Egyptian state. However, his evil brother Set wanted undeserved dominion. Osiris, in his old age, failed to notice Set, who ended up chopping up Osiris and distributing his body parts to all the regions of Egypt. Clear and present evil is a

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10 Mozghan Yahyazade, "Myth from a Psychological Point of View," *Journal of Arts and Humanities* 2, no. 5 (2013).
permanent mark of the world, as per these myths. Set became ruler of Egypt, whereas Osiris lived a ghost-like existence in the underworld. When Osiris’s wife Isis noticed the disappearance of her husband, she went looking for him, and eventually found his phallus and impregnated herself with it. New potential is in view in these myths, when a collapse occurs. Culture can be broken up and drowned, but it always has potential for new birth. Isis gave birth to Horus, who was raised outside of the typical evil Egyptian culture established through the rule of Set. Horus eventually engaged in a horrific fight with Set, who plucked out Horus’ eye. Horus defeated Set and retrieved his eye, but instead of putting the eye back in its socket, he searched for Osiris in the underworld and gave this eye to an aging, blind Osiris. With that, Osiris’ sight was restored. He took Osiris back to the Egyptian kingdom and together they represented Egyptian sovereignty. Horus functions similarly to *logos* or Marduk in this story, defeating chaos in its brutal form. Egyptians see sovereignty in the combination of youthful power (Horus) and the wisdom of the past (Osiris). Ka represents the spirit of the pharaohs which was the combination of Horus and Osiris. Maat then becomes the phenomenon of good order or truth in Egyptian society. If the pharaoh possessed the spirit of Horus and Osiris, then he would be endowed with the ability to decide appropriate action. The Egyptians immortalized the deity of the pharaohs by building the pyramids, which are
considered momentous feats even in today’s industrialized world. The impact of such monuments on the beholder in 5000 BCE is unimaginable.

### 1.4 Mary Shelley’s Frankenstein

We have examined three myths or stories, namely the account of creation in Genesis, the Enuma Elish from the Sumerians, and the Egyptian account of creation. Although these accounts are not necessarily considered factual in today’s world, the western world appears to be built on the principles of these myths. With regard to robots and AI, the myths and stories started around 200 years ago, as can be seen in the bicentennial celebration of Mary Shelley’s book, *Frankenstein*. The novel was conceived during a rainy summer vacation in the Swiss Alps, where Shelley and her husband, Percy Bysshe Shelley, spent nights reading German ghost stories. The novel is a series of letters by explorer Robert Walton to his sister Margaret Saville. Walton takes a daring and dangerous winter voyage to the North Pole; he hopes he will be “accomplishing some great purpose,” to discover the earth’s magnetism, or simply to set foot on undiscovered territory. In his second letter, we read that Walton is gripped with loneliness and bemoans the lack of friends in his life, but he considers himself too sophisticated to share his dreams with his uneducated shipmates. Walton tells his sister

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that the ship has now sailed, and he is confident that he will achieve his aim. We read that the ship has stalled between huge sheets of ice. Walton and his shipmates spot a sledge driven by a gigantic creature about half a mile away. The next morning, they find another sledge stranded on the ice. All but one dog pulling the sledge is alive. The man on the sledge is weak and starving. After two days of trying, Walton convinces the man to board the ship where he is cared for by the crew. The rescued man is Victor Frankenstein who goes on to tell the tale of how he made a human being with “materials within his command.”

Victor is so enamored with the project that he confesses, “my limbs now tremble, and my eyes swim with the remembrance; but then a resistless, and almost frantic impulse, urged me forward; I seemed to have lost all soul or sensation but for this one pursuit.” He had become so occupied with his creation that for two years he missed the seasons, blossoms, and expanding leaves to only regret the moment he saw “the dull yellow eye of the creature open.... How can I describe my emotions at this catastrophe, or how delineate the wretch whom with such infinite pains and care I had endeavored to form?” This was just the beginning of the chaos Victor brought to his world. The monster he created caused fear, pain, and the death of Victor’s immediate

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13 Ibid, 39.
14 Ibid 41.
family and friends. Eventually, Victor himself dies in fear even as the monster walks away to kill himself.

1.4.1 Rossum’s Universal Robots

In 1920, Karel Capek wrote a play called *Rossum’s Universal Robots* (RUR). The play starts by presenting the motive for creating robots as the replacement of back-breaking human labor and the elimination of poverty. Helena Glory, the daughter of the president of the robot business, is shown around the factory by Harry Domin, one of the managers on the factory floor. Domin explains to Helena that the factory is producing lots of robots, and that it will change the world and make labor so cheap that all work and poverty will be eliminated. Helena tries to convince the robots to revolt, but the robots are completely uninterested. Domin falls in love with Helena and asks her to marry him. Ten years down the road, things have taken a turn for the worse. Given that robots do everything, humans are not needed, and hence have stopped having children. Upon hearing this, Helena is upset and burns the formula for making more robots. At the same time, robots begin to revolt, as they are frustrated with their subservience and decide to kill all humans. Led by Domin, humans plan to escape by boat, but find themselves surrounded by robots. There is no compromise in this “black and white” play, and the robots kill all humans except Alquist, the chief engineer at RUR; he is

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spared only to help the robots find the formula for making more robots. Alquist tries but cannot remake the formula to make more robots. Suffering loneliness, Alquist asks robots to bring him humans—but there are no humans to be found. Eventually they find two robots, Primus and Helena, who have souls. Alquist discovers that these robots are in love, which means the human race can be saved. Both Frankenstein and RUR were written when there was little automation or computing around. In both stories the condition of human loneliness and also the threat of the destruction of the world are in view.

1.4.2 Isaac Asimov and Murray Leinster

When computing was in its infancy, biochemist and writer Isaac Asimov introduced three laws of robotics in his book, *The Brain*, published in 1945. This led to many other books on the subject and began a discussion around ethical quandaries arising from advancements in technology and its potential conflict with law and policy. This was the direct antecedent of the root of the problem faced by HAL 9000 in Stanley Kubrick’s *2001: A Space Odyssey*, released in 1968, and by M-5 in the *Star Trek* episode, “The Ultimate Computer,” also aired in 1968.

Asimov’s three laws of robotics are:16

1. A robot may not injure a human being or, through inaction, allow a human being to come to harm.

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2. A robot must obey the orders given it by human beings except where such orders would conflict with the first law.
3. A robot must protect its own existence as long as such protection does not conflict with the first or second laws.

Yet in the event that a robot finds it impossible to obey both the second law and the third law at the same time, it is frozen in a loop of repetitive behavior. This is depicted in the story, Runaround, which is part of Asimov’s collection, I, Robot. Here the characters Powell and Donovan, along with their Robot SPD-13, known as “Speedy,” are sent to Mercury to restart operations at an abandoned mining station. They discover that the photocell banks that provide life-support to the base are running low on selenium, an essential element needed in powering the station, and that the station could soon fail. Speedy can withstand the high temperatures of Mercury and is duly sent to the selenium pool some seventeen miles away. After Speedy disappears for hours, they find Speedy with the help of a primitive robot. They find that the selenium source has had an adverse effect on Speedy and that the robot is malfunctioning. Due to this malfunction, Speedy can’t obey the second law to obey humans and oscillates between the second and third law. Eventually, Powell risks his own life by going out into the heat hoping the first law of robotics will kick in and Speedy will save his life. The plan works, and they are able to fix the photocell banks.
In the 1946 book, *Logic Named Joe*, by Murray Leinster, again in a time when computing was in its infancy, the story is narrated by a “logic repairman” nicknamed Ducky. The “logic” is a computer-like device described as looking “like a vision received used to, only it’s got keys instead of keyboard.” Commands in the logic are processed by punching the keys. Joe proceeds to switch around a few relays in the central intelligence repositories and cross-correlates all the information ever assembled—yielding highly unexpected results. Logic starts to behave unexpectedly and freely leaks content to anyone on demand, for example, providing unexpected assistance to anyone designing custom chemicals that alleviate inebriation, giving inappropriate sex advice to small children, and plotting a perfect murder.

The story ends in the same way as other computer-related fictions, in that Ducky saves civilization by finding and turning off the only logic capable of doing this.

1.5 Ethical lessons from the creation of humans and robotic fiction

What do these myths about creation narratives and the creation of robots teach us?

1.5.1 Community and relationship

The creation narrative is about relationship. In Genesis 1:26-27 we read:

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“Then God said, “Let us make man in our image, after our likeness. And let them have dominion over the fish of the sea and over the birds of the heavens and over the livestock and over all the earth and over every creeping thing that creeps on the earth.” So God created man in his own image, in the image of God he created him; male and female he created them.”

In the context of the Jewish monotheistic authorship of this writing, it is interesting that God says, “Let us make man in our image,” instead of saying, “Let me make man in my image.” Why does God speak in the plural? Many scholars have researched this issue, and from the time of Philo, most Jewish commentators agree that plural is used because God is addressing his heavenly court which includes the angels (cf. Isaiah 6:8). In contrast, Westermann and Jouon preferred a view that sees this as a plural of self-deliberation. Cassuto, on the other hand, suggests it be seen as some sort of self-encouragement as in the Babel account of Genesis 11:7, as well as Psalm 2:3. Christianity has traditionally accepted this as a reference to the trinity, aligning Genesis with the New Testament, which sees Christ as an active participant in the creation narrative (John 1:3, 10; 1 Corinthians 8:6; Colossians 1:16; Hebrews 1:2). However, it is now universally admitted that Christ’s participation in creation is not what the plural meant to the original author.

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18 Wenham, Durham, and Budd, Word Biblical Commentary. Vol 1: Genesis 1-15, 89.
19 Ibid, 84.
20 Ibid, 83.
The communal nature of the creation narrative stands in contrast to Victor Frankenstein’s creation account. While the Genesis narrative goes out of the way to present community and transparency as part of the creation of humanity, Victor Frankenstein lives in secret and keeps his secret creation from all, including his closest family and friends. “One secret which I alone possessed was the hope to which I had dedicated myself; and the moon gazed on my midnight labors, while, with unrelaxed and breathless eagerness, I pursued nature to her hiding places.”

During this time of research and development Victor does not share his ideas or motives with anyone. The distance he creates from his community helps him undertake his awful and dangerous experiment. This is a stark contrast with the way the Genesis narrative sees an entire ecosystem put in place for the flourishing of life on earth.

God’s work beyond creation and into eternity further highlights the transparent and communal way in which God deals with his creation, first through the children of Israel to the time of the kings and judges. God’s dealing continues with the ultimate sacrifice of his son Jesus for the salvation of humankind and in his giving of the Holy Spirit at Pentecost for help, comfort, remembrance, and encouragement. The communal nature of the Christian faith is further emphasized through the many scriptural references to fellowship. Christians are to encourage one another (1 Thessalonians 5:11);

they are not to neglect gathering together (Hebrews 10:25); two are seen as better than one (Ecclesiastes 4:9); our fellowship is with one another, with the Father, and with the Son (1 John 1:3); relationship is seen as mutually beneficial, as “iron sharpens iron” (Proverbs 27:17); Jesus is present when two or three gather in his name (Matthew 18:20); the communal nature of the Breaking of Bread (Acts 2:42); we bear one another’s burdens (Galatians 6:2); together we are members of the body of Christ (Ephesians 5:30); we are to restore relationships and comfort one another (2 Corinthians 13:11); we are be devoted, honoring, and loving of one another (Romans 12:10).

Shelley highlights Victor’s social isolation as depriving him of basic sustenance, fellowship, relief, education, and even humanity itself. Victor has no one to encourage him, keep him accountable, or sharpen him. This contrasts sharply with Christian values which encourage fellowship and accountability, as can be seen in texts such as Colossians 3:16: “Let the message of Christ dwell among you richly as you teach and admonish one another with all wisdom through psalms, hymns, and songs from the Spirit, singing to God with gratitude in your hearts.” Victor’s life of secrecy robbed him

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22 Peter Thomas. O’Brien, Colossians, Philemon (Waco (Texas): Word Books, 1982). 3. “The antecedents of this expression are to be found in the Old Testament where Israel was God’s holy people, (Exodus 19:6) chosen by him and appointed to his service. Having been brought into a covenant relationship with him, Israel was to be a holy nation because he is holy (Leviticus 11:44; 19:2); etc. Christians are “saints” because of the new relationship they have been brought into by God through Jesus Christ. They are set apart for him and his service; as the people of his own possession they are the called and elect community of the end-time: they are “God’s chosen ones, holy and beloved (3:12) whose lives are to be characterized by godly behavior.”
of the privilege of close community and the admonition he should have received therefrom. The result of this isolation is catastrophic in that Victor never enjoyed the wisdom of “safety in the multitude of counsellors” (Prov. 11:14).

Victor abandons his creation at birth, a dramatic contrast to the biblical narrative and promises made by God, the creator, to his creation. Even in the darkest pit, God promises his presence (cf. Gen. 39:2). The promises God gives to his creation in Romans 8:38-39 are deeply reassuring: “For I am sure that neither death nor life, nor angels nor rulers, nor things present nor things to come, nor powers, nor height nor depth, nor anything else in all creation, will be able to separate us from the love of God in Christ Jesus our Lord.” God sets up his creation for relationship and then establishes a set of principles and guidelines for the safety and prosperity of that creation. Victor Frankenstein, on the other hand, abandons his creation at birth without offering it even the chance of assimilating into society or guiding it into becoming a functional “being.” Instead, he relegates it to isolation and to becoming a monster much like himself. These two fundamental issues of isolation and abandonment raise ethical issues that make Frankenstein a cautionary tale for technologists and scientists:

1.5.2 State of the human heart

The Heart is Deceitful Above all Things, and Desperately Sick; Who can Understand it? (Jeremiah 17:9). Shelley’s subtitle to the story, “The Modern Prometheus”
is telling. In Greek mythology, the possible meaning of Prometheus is “forethought.”

He is also known as a cultural hero and trickster credited with the creation of humanity from clay. He is presented as defying the gods by stealing fire and giving it to humans. Prometheus is punished to eternal torment by Zeus for this theft. A comparison between Victor and Prometheus is apt because Victor’s intent fails to be that of scientific enquiry or knowledge. In his words, “Our family was not scientifical.” Instead he is motivated by the glory and fame he might achieve in creating life and defying death:

“My dreams were therefore undisturbed by reality; and I entered with the greatest diligence into the search of the philosopher’s stone and the elixir of life. But the latter obtained my most undivided attention: wealth was an inferior object; but what glory would attend the discovery, if I could banish disease from the human frame, and render man invulnerable to any but a violent death!”

His desire for fame and glory encompasses the whole of Victor Frankenstein’s life:

“I must not omit to record those events which led, by insensible steps to my after tale of misery: for when I would account to myself for the birth of that passion, which afterwards ruled my destiny, I find it arise, like a mountain river, from ignoble and almost forgotten sources; but, swelling as it proceeded, it became the torrent which, in its course, has swept away all my hopes and joys. Natural philosophy is the genius that has regulated my fate; I desire therefore, in this narration, to state those facts which led to my predilection for that science.”

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25 Shelley, Frankenstein, 22.
26 Ibid, 22-23.
The intent of his heart is in focus here, revealing the purpose behind this obsessive pursuit of his. The Bible issues clear warnings in this regard as can be seen in Jeremiah 17:9-10:

The heart is deceitful above all things,
    and desperately sick;
who can understand it?
“I the Lord search the heart
    and test the mind,
to give every man according to his ways,
    according to the fruit of his deeds.”

Craigie, Kelley, and Drinkard comment on this:

“The contrast these two verses speak are the very contrast of the entire unit: deceitful, sinful humanity in contrast to a holy and just God. Indeed, the heart is deceitful and incurably sick. (On the sick heart, cf. Jer. 8:18, where the reference is to heartsickness from grief over Judah’s sin.) Because it is so deceitful, the poet wonders who may know it? From human perspective it may seem that no one can know the inscrutable heart of a person who is deliberately deceitful. Yet the answer is swift in coming. Yahweh knows! Yahweh is the one who searches the heart and tests the inward parts of humankind.”

Apart from Shelley’s allusions to the Christian faith, her character, Victor Frankenstein, uses words from the Book of Common Prayer, allowing the reader to consider whether he may actually be a Christian, or at least have knowledge of the Christian faith:

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“A new species would bless me as its creator and source; many happy and excellent natures would owe their being to me. No father could claim the gratitude of his child so completely as I should deserve theirs. Pursuing these reflections, I thought, that if I could bestow animation upon lifeless matter, I might in process of time (although I now found it impossible) renew life where death had apparently devoted the body to corruption.”

This makes Victor’s pursuit all the more dangerous, not only in this life but also in eternity. Everyone to whom much has been entrusted, much more will be demanded (Luke 12:48). Empathy, care, and sacrifice are basic tenets of Christian faith. None of these can be seen in Victor’s behavior. Apart from the “yellow eyes,” Victor doesn’t even describe his creation. The information we have of this creation comes from Walton who says, “in color and apparent texture like that of a mummy.” By abandoning the voyage, Walton is also presented as one who chooses the safety of his crew over personal ambition, glory, and discovery. While Victor shows a disregard for his fellow humans, failing to even consider the impact of his creation on them, Walton’s actions demonstrate his care for the worth and value of human life.

1.5.3 Boundlessness of God

Great is our Lord and Abundant in Strength; His Understanding is Infinite (Psalm 147:5). Scriptures refer to God’s omniscience (Psalm 147:5; John 21:17; Hebrews

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31 Ibid, 179.
4:12-13; 1 John 3:20), meaning everything God does has an intelligent purpose and end. God knows everything about himself, the details of events on earth, and the future (1 Samuel 10:2; 1 Kings 13:1-4; 2 Kings 8:12; Psalm 139:4; Acts 2:23, 4:27-28).

This character and attributes of God, the supreme attribute being the love of God, stands in contrast to the actions of Victor in the way he creates the monster, and the deadly effects it has on his community and himself. Paul defines love as the instinctive ability to protect and provide for the other as you would your own self. The Ten Commandments, the Beatitudes, the entirety of the precepts laid out in the Bible are meant for provision and protection of the human race that God created. The narrative culminates in the ultimate act of love with Christ giving his own life for those he loved. The church has a role to play in defining how technology and its application in artificial intelligence is developed in the years to come.

1.6 Pierre Teilhard de Chardin’s noosphere

It has been noted that much of the AI-related fiction that follows seems to be rooted in the theological writing of French idealist, philosopher and Jesuit priest, Pierre Teilhard De Chardin entitled, The Phenomenon of Man, written in 1930 but posthumously published in 1955.33 Borrowing Huxley’s expression, Teilhard describes

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humans as an evolution toward becoming conscious of itself.\textsuperscript{34} In contemporary conceptions of AI, this natural or biological intelligence, which becomes conscious of itself, is carried over to artificial intelligence, which then also becomes conscious of itself in computing fiction that gets published after 1950. Teilhard integrates the scientific imagery of evolution with eschatological visions. He contends that the world will progress due to science and technology to a point where individual human consciousness will transcend itself, becoming a communal unity of mind. He calls it the Omega Point—expressed in Christ, where love is expressed in its fullness.\textsuperscript{35}

“We are today witnessing a truly explosive growth of technology and research, bringing an increasing mastery, both theoretical and practical, of the secrets and sources of cosmic energy at every level and in every form; and, correlative with this, the rapid heightening of what I have called the psychic temperature of the earth. A single glance at the overall picture of surface chaos is enough to assure us that this is so. We see a human tide bearing us upward with all the force of a contracting star; not a spreading tide, as we might suppose, but one that is rising: the ineluctable growth of our horizon of a true state of ‘ultra-humanity.’”\textsuperscript{36}

With technological automation of surplus human tasks, Teilhard claims that humanity is now freer to reflect upon the universe and its place within it. Unification, technification, and a growing rationalization will lead the human race to transcend itself in an event he calls “anthropogenesis.”\textsuperscript{37} John Polkinghorne picks up Teilhard’s Omega

\textsuperscript{34} Ibid, 220.
\textsuperscript{35} Ibid, 320-22.
\textsuperscript{36} Ibid, 275-76.
\textsuperscript{37} Ibid, 227-37.
Point as represented in scientific evolutionary language, as well as linked religiously to the second coming of Christ. Proponents of Cyberspace have picked up Teilhard’s concept of creation and of life evolving toward some purposeful end. Teilhard’s noosphere is a vision that captures the essence of cyberspace and its internet component. The noosphere, from the Greek nous for “mind,” is seen as the materialization of a global consciousness, which results in earth being clothed in a “new skin” and even a “soul.” Teilhard speaks to its coming in terms of fire: “A glow ripples outwards from the first spark of conscious reflection. The point of ignition grows larger. The fire spreads in ever widening circles till finally the whole planet is covered with incandescence.”

Mark Pesce and Jennifer Cobb claim that cyberspace creates Teilhard’s noosphere. According to Cobb, Cyberspace manifests Teilhard’s concepts of interiorization and organization. For Teilhard, interiorization is the spiritual energy that allows an individual’s thoughts and ideas to interpenetrate with other individuals to create a wider consciousness. By contrast, organization talks of the social processes that give birth to, and support, the emergence of the noosphere. Pesce thinks the web is

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39 Cyberspace is seen by some as an “emergent phenomenon” with the interaction of its various components giving rise, for some, to a new, unforeseen wonder that transcends its components, and sometimes, goes beyond purely physical laws. See Margaret Wertheim, *The Pearly Gates of Cyberspace: A History of Space from Dante to the Internet* (New York, NY: W.W. Norton, 1999), 227.
merely part of Teilhard’s prophecy. He posits, then, that perhaps cyberspace forms a part of our evolution as human beings, in much the same way as the development of our eyes, hands, and brains.\textsuperscript{42}

In Asimov’s, The Last Question,\textsuperscript{43} he introduces the idea of an evolving computer that absorbs humanity. He writes, "One by one man fused with AC (alternate current), each physical body losing its mental identity in a manner that was somehow not a loss but a gain," implying that man can then become God. This was also hinted at in John Varley’s Millennium.\textsuperscript{44} It has become part of the ongoing gospel of the Singularity, evidenced by Ken McLeod’s novels The Star Fraction (1995) and the Cassini Division (1998), and Charles Stross’s Accelerando (2005) and Singularity Sky (2003), among others.\textsuperscript{45} Note that all of these were quite possibly originally influenced by the publication of Teilhard De Chardin’s theological work The Phenomenon of Man, which first posited the “Omega Point,” as the notion that all matter (and humanity especially) were evolving toward a union with God. Asimov’s twist was that the mechanism for doing so would be our computers.

\begin{itemize}
\item \textsuperscript{43} Isaac Asimov, \textit{The Best of Isaac Asimov} (New York: Ballantine Books, 1982).
\item \textsuperscript{44} John Varley, \textit{Millenium} (Berkley, 1983).
\item \textsuperscript{45} Ken MacLeod, \textit{The Star Fraction} (London: Orbit, 2004); \textit{The Cassini Division} (London: Orbit, 2004); Charles Stross, \textit{Singularity Sky} (London: Orbit, 2005); \textit{Accelerando} (London: Orbit, 2006).
\end{itemize}
Lester Del Ray's *The Runaway Robot* first captured the idea that a computer (or a robot in this case) could accidently become sentient. Del Ray just barely managed to eke past the better, more thoughtful novel by Robert Heinlein, *The Moon is a Harsh Mistress*, which introduced a more memorable and intelligent (in fact, supra-intelligent) but immature computer character, Mycroft. The concept of a child-like artificial intelligence being guided through ethical dilemmas and holding onto its existence in the face of possible extinction was further explored in David Gerrold’s novel *When Harlie was One*. This idea led to the plots of the movie *Short Circuit* (1986) and *Star Trek: The Next Generation*’s "Evolution" episode, each examining the question of "what is the value of an intelligent life?" *Star Trek* explored the same question with regard to the Android, Data, in "The Measure of a Man" and "Offspring," and it was again explored in the Star Trek: Voyager episode "Author, Author," among others. The book, *Colossus*, written by Dennis Feltham Jones, portrayed AI evolving a very different ethic than ours—drawing from the themes in R.U.R. and Frankenstein—they were the direct antecedent to Skynet of the Terminator Series (1984- ) by way of Fred Saberhagen’s "Berserker" series (1967 and onwards), Proteus IV from Demon Seed (1977), and even the Master Control Program from Disney’s *Tron* (1982).

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2. Artificial intelligence and the Imago Dei

Artificial Intelligence is an application of technology. The Oxford dictionary defines technology as scientific knowledge used in practical ways in industry, for example in designing new machines.⁵⁰ Technology was an important element in the work of Martin Heidegger, one of the most influential philosophers in the last century. His book, The Question Concerning Technology, is considered a ground-breaking work for its influence on philosophy and its definition of technology. Heidegger claims:⁵¹

a. Technology is “not an instrument,” it is a way of understanding the world;
b. technology is “not a human activity,” but develops beyond human control; and
c. technology is “the highest danger,” risking us to only see the world through technological thinking.

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Figure 2-1: Heidegger’s unification of Aristotle’s causes

Heidegger relies heavily on Aristotle’s four causes, namely, matter, form, agent and purpose which he explains as, “four causes: the causa materialis, the material…the causa formalis, the shape, the form of which the material enters…the causa finalis, the end…the causa efficiens, which brings about the effect that is the finished.” He explains that whoever builds a house or a ship or forges a sacrificial chalice reveals what is to be brought forth, according to the terms of the four modes of occasioning. The key question Frankenstein’s monster asks can be put through Heidegger’s claims: “My person was hideous and my stature gigantic. What did this mean? Who was I? What was I? Whence did I come? What was my destination?” The materials used in this fiction are a mystery to us, hence the first cause, materialis, which

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52 Ibid, 3.
53 Ibid.
54 Ibid, 295.
55 Shelley, *Frankenstein*, 143.
would not be appropriate to discuss. The monster is not simply a physical object but a mixture of different life experiences. His first encounter with the character De Lacey starts with an admiration of the beauty of humans.\textsuperscript{56} The monster then turns on humans and declares war on them due to his negative experience.\textsuperscript{57} So causa efficiens are not just his physical aspects but include his traumatizing experiences from spending time around humans. The causa formalis raises another important issue. That the monster cannot simply be a form of technology, “puts to nature the unreasonable demand that it supply energy which can be extracted and stored as such.”\textsuperscript{58} According to Heidegger, humankind’s relationship with nature is to reveal its hidden purposes in order to exploit it for whatever it may provide, much the same way Victor’s monster finds fire left by some beggars and it provides him warmth from cold. This may be an exploitation of earth’s resources in a primitive way, but it’s still exploitation. Heidegger’s third cause, causa finalis, is about the monster’s goal or purpose. There is a bifurcation in the causa finalis of the monster. Initially it is to solve Victor’s passion for renown and glory, but when the monster becomes aware of this, he adopts an unwavering focus on both killing anyone linked to Victor and finding a female companion. Heidegger would call this correctness of purpose, correct in not having the appearance of humans. Hence, he is

\textsuperscript{56} Ibid, 118.
\textsuperscript{57} Ibid, 152.
\textsuperscript{58} Heidegger and Lovitt, The Question Concerning Technology, and Other Essays, 8.
unable to live fully as human, which gives rise to the desire to gain a female companion, an attempt to partake in a fuller human experience. According to ancient doctrine, the essence of a thing is considered to be what the thing is. We ask that same question concerning technology. Two common statements answer our question. One says: technology is a means to an end. The other says: technology is a human activity. The two definitions of technology belong together. For to posit ends and procure and utilize the means to them is a human activity. The manufacture and utilization of equipment, tools, and machines, the things themselves, and the needs and ends that they serve, all belong to what technology is. The whole complex of these contrivances is technology. Technology itself is a contrivance, or, in Latin, an instrumentum. The current conception of technology, according to which it is a means and a human activity, can therefore be called the instrumental and anthropological definition of technology.59

The application of technology in the advent of AI raises the question of human dignity, value, and esteem. Applying Heidegger’s lens to a recent exposé about Amazon’s success in the use of robots is a revealing exercise. In his article, Josh Dzieza reveals the life of Amazon warehouse employees.

“Jake, who asked to use a pseudonym out of fear of retribution, was a “rebinner.” His job was to take an item off a conveyor belt, press a button, place the item in whatever cubby a monitor told him to, press another button, and repeat. He likened it to doing a twisting lunge every 10 seconds, nonstop, though

59 Ibid, 320.
he was encouraged to move even faster by a giant leaderboard, featuring a
cartoon sprinting man, that showed the rates of the 10 fastest workers in real
time. A manager would sometimes keep up a sports announcer patter over the
intercom — “In third place for the first half, we have Bob at 697 units per hour,”
Jake recalled. Top performers got an Amazon currency they could redeem for
Amazon Echos and company T-shirts. Low performers got fired. “You’re not
stopping.” Jake said. “You are literally not stopping, It’s like leaving your house
and just running and not stopping for anything for 10 straight hours, just
running.” After several months, he felt a burning in his back. A supervisor
sometimes told him to bend his knees more when lifting. When Jake did this his
rate dropped, and another supervisor would tell him to speed up. “You’ve got to
be kidding me. Go faster?” he recalled saying. “If I go faster, I’m going to have a
heart attack and fall on the floor.” Finally, his back gave out completely. He was
diagnosed with two damaged discs and had to go on disability. The rate, he said,
was “100 percent” responsible for his injury. Every Amazon worker I’ve spoken
to said it’s the automatically enforced pace of work, rather than the physical
difficulty of the work itself, that makes the job so grueling. Any slack is
perpetually being optimized out of the system, and with it any opportunity to
rest or recover. A worker on the West Coast told me about a new device that
shines a spotlight on the item he’s supposed to pick, allowing Amazon to further
accelerate the rate and get rid of what the worker described as “micro rests”
stolen in the moment it took to look for the next item on the shelf. People can’t
sustain this level of intense work without breaking down.”

In Heidegger’s view, Amazon’s goods have multiple goals and purposes. They
reveal not just an easy to use website or access to millions of products through one-click
checkout, but serve to maximize profits for Amazon, even if that comes at the cost of
human suffering and destruction: swollen knees, damaged spinal discs, burning backs,
heart attacks, and grueling shifts. Attempts at suicide seem to be a reasonable alternative

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to cost efficiencies, all of which contribute to the mechanization of humankind. Ironically in Heidegger’s viewpoint, Victor’s monster is more human than Amazon’s employees, as he has freedom to roam around, see nature, and to discover the purpose of objects. By contrast, Amazon employees are treated as reserves to be on hand for further ordering. The monster answers his own question, “What is my destination?” He determines that his actions have been too destructive, leaving Walton’s ship to end his own life. In a world dominated by companies like Amazon and being eaten by technology, to ask, “what does it mean to be a human being?” Are there theological implications to the continually evolving world of AI? Christianity’s supreme tenet about human nature is that humans are made in the image of God: they bear the likeness of God. This tenet has lasted thousands of years and through many cultures, languages, and the evolution of our world. What makes humanity unique, even compared to animals? With Heidegger’s definition of technology we will now examine the background and progress of AI thus far, then contrast it with the progress of humans, in light of the imago dei. The following chapter will discuss human-AI symbiosis, and whether anything like the imago dei is conceivable for AI.

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2.1 Background and definitions

Artificial Intelligence is an intellect programmed in a robot or machine that is smarter than the best human brains in practically every field, including scientific creativity, problem-solving, and social skills. There is both euphoria and despair over the idea of very intelligent machines. However, massive investments by top technology companies and governments in the past decade or so have resulted in significant improvements in making machines intelligent, and in some cases even “superintelligent.” For example, computers playing checkers, backgammon, Othello, chess, crosswords, Scrabble, bridge, Jeopardy! Poker, FreeCell, and Go have all beaten world champions at these games. The concept of “superintelligence” is now a part of colloquial vocabulary due to its coverage in the mainstream media; other media have also started covering the progress of superintelligence powered by AI. For example, on February 13, 2016, the Daily Mirror, a British tabloid, headlined superintelligence:

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“Robots to take 50% of our jobs by 2050 and outperform humans at almost anything.”\footnote{Andrew Gregory, “Robots ’to Take 50% of Our Jobs by 2050 and Outperform Humans at Almost Anything’,” \textit{Daily Mirror}, http://www.mirror.co.uk/news/technology-science/robots-to-take-50-jobs-7363442.} Such headlines may sensationalize the issue and get more clicks on the tabloid’s website. But other developments such as the GoogleGO AI machine beating the world master Lee Se-dol at Go\footnote{Sam Byford, “Google’s AplhaGo Ai Beats Lee Se-dol Again to Win Go Series 4-1,” \textit{The Verge}, https://www.theverge.com/2016/3/15/11213518/alphago-deepmind-go-match-5-result.} and Facebook replacing humans with machines to write its trending news section gives credence to the emerging concerns around AI and its implications.\footnote{Joon Ian Wong, Dave Gershgorn and Mike Murphy., “Facebook Is Trying to Get Rid of Bias in Trending News by Getting Rid of Humans,” \textit{Quartz}, http://qz.com/768122/facebook-fires-human-editors-moves-to-algorithm-for-trending-topics.}

Given the progress and reporting on superintelligence, the issue to be addressed is: how should Christians think of superintelligence and its impact on human life through the lens of Christian ethics? The terms and concepts used to discuss superintelligence lack clarity and precision. Instead of attempting to explain them all, I will limit my discussion to the concepts of computer programming, AI, superintelligence, and singularity.

\begin{enumerate}
\item [2.1.1] \textbf{Computer programming}

Computer programming is “the craft of writing useful, maintainable, and extensible source code which can be interpreted or compiled by a computing system to perform a meaningful task. Programming a computer can be performed in one of numerous languages, ranging from a higher-level language to a low-level machine code
which is code that more directly controls the specifics of the computer's hardware, and microcode which directly controls the electronics in the computer.”

2.1.2 Artificial Intelligence

Artificial Intelligence (AI) is apparently exhibited by machines or software. It is also the name of the academic field of study of creating computers and computer software that are capable of intelligent behavior. Major AI researchers and textbooks define the field as "the study and design of intelligent agents," in which an intelligent agent is a system that perceives its environment and takes actions that maximize its chances of success. John McCarthy, who coined the term in 1955, defines it as “the science and engineering of making intelligent machines.”

2.1.3 Superintelligence

Superintelligence signifies that an electronic agent may possess intelligence far exceeding that of the smartest human being. I. J. Good, chief statistician in Alan Turing's

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code-breaking team in World War II, first explained the concept of machines matching human likeness and intelligence in 1965. He states:

“Let an ultraintelligent machine be defined as a machine that can far surpass all the intellectual activities of any man, however clever. Since the design of machines is one of these intellectual activities, an ultraintelligent machine could design even better machines; there would then unquestionably be an "intelligence explosion," and the intelligence of man would be left far behind. Thus, the first ultraintelligent machine is the last invention that man need ever make, provided that the machine is docile enough to tell us how to keep it under control.”

Vernor Vinge and Ray Kurzweil popularized the idea of a coming technological singularity—the hypothesis that the invention of artificial superintelligence will abruptly trigger runaway technological growth, resulting in unfathomable changes to human civilization. They characterize a scenario wherein machines reproduce their superior versions without any intervention from humans, and at speeds beyond human control. Some see positive outcomes from this development. Economist Robin Hansen argues that when a hypothetical singularity is realized, the doubling of the world

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economy will take only 6.3 years, compared to such doubling taking 224,000 years for hunter-gatherers and 909 years for the farming society.\textsuperscript{71}

\section*{2.2 Current progress of AI}

If artificial intelligence is to match, exceed, or replace humans, then several questions need to be addressed. What is Artificial Intelligence? What is a human being? How are humans different from animals and other creatures? What makes human beings unique? Does the biblical idea of the \textit{imago dei} (image of God) apply to AI or forms of AI? What does it mean to be an Image bearer in the context of \textit{imago dei}?

According to John Mallery, the term “AI-Complete” was proposed by Fanya Montalvo in the 1980s.\textsuperscript{72} A somewhat general definition of the term included in the 1991 Jargon File states: “AI-Complete: [MIT, Stanford, by analogy with ‘NP-complete’] adj. Used to describe problems or subproblems in AI, to indicate that the solution presupposes a solution to the ‘strong AI problem’ (that is, the synthesis of a human-level intelligence). A problem that is AI-complete is, in other words, just too hard. Examples of AI-complete problems are ‘The Vision Problem,’ building a system that can see as well as a human, and ‘The Natural Language Problem,’ building a system that can

\textsuperscript{71} Robin Hanson, “Shall We Vote on Values, but Bet on Beliefs? Shall We Vote on Values, but Bet on Beliefs?”, \textit{Journal of Political Philosophy} 21, no. 2 (2013).

understand and speak a natural language as well as a human. These may appear to be modular, but all attempts so far (1991) to solve them have foundered on the amount of context, information, and `intelligence' they seem to require.”

Intelligent agents, robotics, self-learning, and self-healing algorithms will support the evolution of the human race, including physical, mental, and meta-physical impacts for some, even providing the ability to recreate or augment the human brain and mind using silicon chips. In the light of this, the Jargon File is a limiting definition in that, though computer science and powerful algorithms influence AI, the definition does not acknowledge areas of cognitive science such as psychology, neuroscience, and philosophy. Carnegie Mellon University’s AI department defines AI simply: “AI must understand the human needs and it must make smart design decisions based on that understanding. Built from technologies called AI Stack.”

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<table>
<thead>
<tr>
<th>Thinking Humanly</th>
<th>Thinking Rationally</th>
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</thead>
<tbody>
<tr>
<td>“The exciting new effort to make computers think… machines with minds, in the full and literal sense.”</td>
<td>“The study of mental faculties through the use of computational models.”</td>
</tr>
<tr>
<td>“[The automation of] activities that we associate with human thinking, activities such as decision-making, problem solving, learning…”</td>
<td>“The study of the computations that make it possible to perceive, reason and act.”</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Acting Humanly</th>
<th>Acting Rationally</th>
</tr>
</thead>
<tbody>
<tr>
<td>“The art of creating machines that perform functions that require intelligence when performed by people.”</td>
<td>“Computational Intelligence is the study of the design of intelligent agents.”</td>
</tr>
<tr>
<td>“the study of how to make computers do things at which, at the moment, people are better.”</td>
<td>“AT … is concerned with intelligent behavior in artifacts.”</td>
</tr>
</tbody>
</table>

**Figure 2-2: Russell and Norvig’s Four Forms of Artificial Achievement**

In their textbook, Stuart Russell and Peter Norvig show that the overall goal of making systems that function as humans do is only one of four significant approaches to artificial intelligence. In figure 2.1. above, they identify two axes around which definitions tend to order themselves, showing distinction between thoughts versus

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actions. AI must be able to think or understand like humans and then in return, based on that thought or understanding, be able to behave like humans. Those that measure success in terms of how like a human being a system performs fail at one end, while those that look for systems that behave according to an ideal concept of intelligence, which they call rationality, fail on the other end. The latter concept is observed as a system correctly performing the task at hand, regardless of how human-like it is in its approach or appearance.76

Stephen Garner claims that the development and deployment of AI, especially in the area of medicine and neurology, has given hope to those suffering from Parkinson’s disease or multiple sclerosis and has given sight perception to those suffering from blindness.77 Experimental AI implants are being developed that allow computers to be controlled in a limited way by the operator’s thoughts.78 Such developments excite the likes of Kurzweil, who says that at some point in the future the distinction between machine and human will no longer matter.79 Rodney Brooks is more pessimistic about the progress of getting there:

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76 Russell and Norvig, Artificial Intelligence: A Modern Approach, 2, 4-5.
When AI got started the clear inspiration was human level performance and human level intelligence. I think that goal has been what attracted most researchers into the field for the first sixty years. The fact that we do not have anything close to succeeding at those aspirations says not that researchers have not worked hard or have not been brilliant. It says that it is a very hard goal.\textsuperscript{80}

Commenting on the faith of many researchers in this field, he goes on to say:

They think that intelligent robots will provide a path to immortality. They expect that before they die the technology will be available that will let them download their consciousness into a computer or robot and they will be able to live in this form forever.\textsuperscript{81}

Kurzweil and Hans Moravec argue that brain scanning might eventually lead to being able to recreate the brain’s organization on a computer. Kurzweil predicts that in the 2030s we will be able to create the models that recreate brains in silicon.\textsuperscript{82} However, Brook’s words of caution seem to come true. A much-hyped project that IBM sold to MD Anderson Cancer Center to eradicate cancer had to be cancelled. MD Anderson paid IBM $62 million and dedicated countless man hours of medical staff to make the cancer-healing AI a success. Even \textit{Scientific American} bought into it: the magazine gave the project more publicity by publishing an article on IBM Chief Technology Officer Rob High and financier Jho Low (now on the run from law enforcement), whose foundation


\textsuperscript{82} Kurzweil, ”The Coming Merging of Mind and Machine,” 60.
funded the project. David Howard, a faculty member in the Department of Health Policy and Management at Emory University, commented on the AI project: “IBM spun a story about how Watson could improve cancer treatment that was superficially plausible,” he wrote. “Artificial intelligence has been suffering from overhype since the 1970s and 1980s,” said Steven Salzberg, a professor of biomedical engineering at the Johns Hopkins School of Medicine. “Be skeptical and ask to see some evidence. [Technology companies] need to do more than simply assert that it works.”

With billions of dollars poured into AI research by Facebook, the company still keeps hiring thousands of human fact-checkers to handle fake news. Automation through AI is not on the horizon yet. Dominic Basulto, a digital thinker at Bond Strategy and Influence, laments that Artificial intelligence (AI) researchers are creating advanced forms of machine learning that rival human intelligence; engineers and designers are printing tissues, bones and organs using 3D printers; biologists are creating entirely new "synthetic" life forms and medical researchers are creating radical new enhancements for the human body in which man and machine essentially become one.

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Regardless of one’s stance on creationism, intelligent design, or evolution, these new “god machines,” re-open the eternal existential questions: what is the origin of life? What does it mean to be alive? Is AI alive, or can the category of “alive” be assigned to AI? What is the purpose of life? Such arenas of anxiety deserve theological reflection and discussion of the doctrine of *imago dei* so as to understand how AI integrates with humans and the place of humans in a technology-led world.

### 2.3 Imago Dei

The Bible has very few references that discuss the doctrine of the *imago dei*, however, its voice is clear and direct, leaving no doubt about the idea of human beings being made in the Image of God. In the creation account in Genesis 1:26-28, God creates human beings, both male and female, in his image and likeness, unique compared to other creatures:

“Then God said, ‘Let us make humankind in our image, according to our likeness; and let them have dominion over the fish of the sea, and over the birds of the air, and over the cattle, and over all the wild animals of the earth, and over every creeping thing that creeps upon the earth.’ So, God created humankind in his image, in the image of God he created them; male and female he created them. God blessed them, and God said to them, ‘Be fruitful and multiply and fill the earth and subdue it; and have dominion over the fish of the sea and over birds of the air and over every living thing that moves upon the earth.’”

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The words “image” and “likeness” of God somehow offer humans a unique place within the created order. Another much-cited reference is Psalm 8:3-8:

“When I look at your heavens, the work of your fingers, the moon and the stars that you have established; what are human beings that you are mindful of them, mortals that you care for them? Yet you have made them a little lower than God, and crowned them with glory and honor. You have given them dominion over the works of your hands; you have put all things under their feet, all sheep and oxen, and also the beasts of the field, the birds of the air, and the fish of the sea, whatever passes along the paths of the seas.”

2.3.1 Positive or liberating meanings of the Imago Dei

In his commentary, Gordon Wenham shows that the word “image” appears only seventeen times in the Hebrew scriptures, with ten of those referring to physical images and idols, as in Numbers 33:52, images of tumors in 1 Samuel 6:5, and images of men as in Ezekiel 16:17. Psalms 39:6 and 73:20 refer to human existence as an image or a shadow. The rest of the references are in the passages discussed above in Genesis, and stand as foundational to the understanding of the *imago dei*. Wenham continues to explain that the word “image” used in the Genesis texts moves from a concrete image to an abstract one. He, however, emphasizes the “opaqueness” of the original meaning to both ancient and modern readers of Genesis. To relate concrete likeness, the verb “to be like, resemble” is used to denote an object like a plan or model (e.g. 1 Kings 16:10).

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88 Ibid.
89 Ibid.
90 Ibid.
Human beings made in God’s image are common in the ancient Near Eastern writings, but in those myths they are reserved for monarchy, royalty, and the Marduks of the Mesopotamian religion. Wenham impacted the idea of *imago dei* in modern Christendom through the three questions he asks:

<table>
<thead>
<tr>
<th>Questions raised by Gordon Wenham on Genesis 1:26-27</th>
<th>Views formed as a result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 What are the implications of God speaking in plural (us and our) in Genesis 1:26?</td>
<td>Image is substantive, reflecting God in the physical, psychological and metaphysical areas of the human being.</td>
</tr>
<tr>
<td>2 Do prepositions used in Genesis 1, “in” and “according”, have specific meaning or force?</td>
<td>Image is relational – both in respect to relationship with God and relationship with fellow humans.</td>
</tr>
<tr>
<td>3 Is there a difference in meaning between the terms “image” and “likeness”?</td>
<td>Image is shown functionally, in that human beings act as God or God’s agents in the world because they are created in the image of God.</td>
</tr>
</tbody>
</table>

![Figure 2-3: Wenham’s Questions Surrounding the Imago Dei](image)

In the New Testament, the word for “image” appears twenty-three times, while the word for “likeness” appears only once. Of the twenty-three times that the word “image” is written in the New Testament, Gerald Bray clarifies that the ten references in Revelation and the one in Hebrews are irrelevant to the image of God discourse. Matthew 22:20, Mark 12:16, and Luke 20:24 refer to Caesar’s image as a comparison between God and Caesar, as opposed to a discussion on the *imago dei*. Prohibition of

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violence against humans is in view in James 3:9, which is consistent in a spiritual sense with the prohibition of shedding human blood in Genesis 9:6.\(^2\)

Paul uses the word, “image,” nine times in his letters (Romans 1:23, 8:29, 1 Corinthians 11:7, 15:45-49, 2 Corinthians 3:18, 4:4, Colossians 1:15, 3:9-10). Christ being the true and perfect image of God is in view in all these references. While the Old Testament uses the word “image” to highlight likeness between the divine and humankind, the New Testament uses the same word to point out the distance between the divine and humankind (or the distance from the garden of Eden). The oneness of God and Christ is highlighted in the New Testament. With the use of the word “image” it presents the only hope for humankind to bridge this distance through bodily resurrection. Paul writes in 1 Corinthians 15:45-49:

“Thus it is written, ‘The first man, Adam, became a living being’; the last Adam became a life-giving spirit. But it is not the spiritual that is first, but the physical, and then the spiritual. The first man was from the earth, a man of dust; the second man is from heaven. As was the man of dust, so are those who are of the dust; and as is the man of heaven, so are those who are of heaven. Just as we have borne the image of the man of dust, we will also bear the image of the man of heaven.”

The doctrine of the *imago dei* gained steam throughout the history of the Church. To highlight a few examples here, the trinity is how Augustine (354-430 CE) understood the *imago dei*, especially in his reading of Genesis 1’s plural: “Let us make.” He is

attracted to both rational and relational elements of the trinity. This capacity, he insists, is given by God to humans to relate to Him. The logic chip inside the computing device that powers AI is a rational processing unit. The rational element of the trinity that Augustine highlights brings our discussion of AI possessing human elements a lot closer. If rationality is image-bearing, then synthetic systems that are rational may also to some degree bear the image. This question raises significant ethical issues, which will be discussed later. Martin Luther (1483-1546), in his commentary on Genesis 1:26, states:

“Therefore, my understanding of the image of God is this: that Adam had it in his being and that he not only knew God and believed that He was good, but that he also lived in a life that was wholly godly; that is, he was without the fear of death or of any other danger, and was content with God’s favor.”

Luther focuses on the loss, as a result of the fall, of the imago dei in its every sense, such as the capacity for language and description.

“Therefore, that image of God was something most excellent, in which were included eternal life, everlasting freedom from fear, and everything that is good. However, through sin this image was so obscured and corrupted that we cannot grasp it with our intellect.”

Luther’s restoration of the imago dei is only through the new birth in Christ for those who participate in Christ’s righteousness and life. His restored imago dei is only

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95 Ibid, 63.
96 Ibid, 65.
found in the consummation of the kingdom of God.\textsuperscript{97} Another important aspect of Luther is his distinction of the soul from the body or flesh. For him, the soul is superior to the flesh, as it is immortal and to be equated with the concept of spirit.\textsuperscript{98}

During the Enlightenment, understanding of the universe and human beings underwent a significant shift. Rationality and morality took center stage in the understanding of the \textit{imago dei}. This in turn placed humans in the spotlight of those responsible and accountable to shape the world.\textsuperscript{99} Francis Bacon (1561-1626) is called the father of empiricism for his work in inductive reasoning and careful observation of nature.\textsuperscript{100} David Noble argues that Bacon is responsible for the roots of the modern techno-cultural society that developed post-Enlightenment.\textsuperscript{101} The rationalist method of problem-solving was influenced by René Descartes (1596-1650). He asserted that human bias made empirical knowledge less reliable as compared to mathematical knowledge, which is certain. His methods of reducing problems to smaller sub-problems, ranking ideas simplest to most complex, and ensuring nothing was omitted, but all items were addressed were influential in the age of reason.\textsuperscript{102} Humanity’s place in the world was

\textsuperscript{97} Ibid, 64-65.
\textsuperscript{98} Ibid, 1.15.2.
\textsuperscript{100} Thomas Fowler, \textit{Bacon} (London: Low, 1887), 346.
further altered with the shift from earth being the center of the universe to the sun being
the center, as reinforced by Galileo. God’s power versus human ability to change and
transform the world is best articulated by Blaise Pascal (1623-1662):

“Man is only a reed, the weakest in nature, but he is a thinking reed. There is no
need for the whole universe to take up arms to crush him: a vapor, a drop of
water is enough to kill him. But even if the universe was to crush him, man
would still be nobler than his slayer, because he knows that he is dying and the
advantage the universe has over him. The universe knows none of this.”

Pascal highlights the dichotomy between humans’ ability to understand
themselves and the universe and also their ability to feast on the wretchedness of the
world. He balanced the tension in these words:

“It is dangerous to explain too clearly to man how like he is to the animals
without pointing out his greatness. It is also dangerous to make too much of his
greatness without his vileness. It is still more dangerous to leave him in
ignorance of both, but it is most valuable to represent both to him. Man must not
be allowed to believe that he is equal either to animals or to angels, not to be
unaware of either, but he must know both.”

Is the divine, the unique, and the great in humanity quantifiable? How are these
affected in human nature by sin and the fall? Are these to be imaged in AI as humans
pursue their quest? Pascal comments further:

“One is that man in the state of his creation, or in the state of grace, is exalted
above the whole of nature, made like unto God and sharing in his divinity. The
other is that in the state of corruption and sin he has fallen from that first state
and has become like the beasts. Scripture openly declares this when it says in certain places: My delights were with the sons of men – I will pour out my spirit upon all flesh – Ye are gods, while saying in others: All flesh is grass – Man is like the beasts that perish – I said in my heart concerning the estate of the sons of men. When it is clearly evident that man through grace is made like unto God and shares his divinity, and without grace he is treated like the beast of the field.”

Pascal talks of the division of the human body from the *imago dei*. The body in turn becomes an object for the mind. Whereas the body is attached to the creation or the material, the *imago dei* drives the person to look beyond the material and finite. Those that seek will encounter and enter into a relationship with the transcendent God. Can AI cross over beyond the material and finite? The image of God is both the greatest strength of humanity and its greatest weakness, with the chance of arrogance developing along with its finitude. Bearing God’s image is not just a fact, it is a vocation, says N.T. Wright. Wright is a proponent of the functional view of the *imago dei*. Based on the concept of “building for the kingdom” which is grounded in the functional understanding of the *imago dei*, Wright argues for Christians to be involved in justice, beauty, and evangelism. Meanwhile, Millard Erickson claims that the image of God must be seen in terms of structure rather than function or relationship. The

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106 Ibid.
universality of the image means that it must be something that humans are, rather than something they have or do. The visible capacities of relationship, introspection, thought, and free will in humans is what makes us bear the imago dei. Gregory Peterson tries to include other creatures in the world through the idea of consciousness:

“Other animals certainly do not have the kind of self-consciousness that we have. But evidence from cognitive ethnology suggests that the mode of discourse should shift away from absolute claims to uniqueness to the kind of uniqueness we have as well as to the ways we are similar and dissimilar to other organisms in the world.”

Humans share 98% of their DNA with Chimpanzees. AI will exceed the knowledge (memory storage), intellect, and rational capability of humans. So, where would the imago dei be located physically? Ted Peters asks if human DNA is sacred. Is the sanctity of DNA part of the human makeup? What is the alpha and omega of Image-bearing?

In discussing the resemblance between images versus what is a real copy, Gerhard von Rad adds to the discussion on “the likeness” in Genesis 1:27. His focus turns on the word “dominion,” especially over animals, in image-bearing: “The close

112 Ibid, 513-14.
relation of the term for God’s image with that for the commission to exercise dominion emerges quite clearly when we have understood “celem” (image) as a plastic image.”

The imago dei within a social context is stressed by many theologians, including Erickson, who states that the Godhead is a social community, demonstrated by humanity’s creation as male and female. Karl Barth argues:

“But the divine form of life, repeated in the man created by Him, consists in that which is the obvious aim of the ‘Let us.’ In God’s own being and sphere there is a counterpart: a genuine but harmonious self-encounter and self-discovery; a free co-existence and cooperation; an open confrontation and reciprocity.”

There is a sense of partnership, openness, encounter, and discovery in the most authentic manner in the universality of the imago dei. The reality of one’s relationship with God always exists, whether that relationship is positive, with the person turning to God, or negative, turning away from God. With AI and associated technologies being rolled out, what does it mean to be a relational being? The entire point of the cross and the Church is to heal relationships both with God and fellow mankind and to enjoy these relationships to live a life of knowledge and wisdom. The Eucharist marks the climax for relational and communal beings.

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117 Ibid, 58.
118 Erickson, Christian Theology, 505.
120 Erickson, Christian Theology, 508-09.
While social media makes “connecting” with people fluid, it also has the ability to distract us from the real “us,” the authentic community. R.C Sproul laments,

“How are our updates all about our victories— I just made cookies for the family; My son just hit the game winning home run; rather than our failures- I just shouted at my little girl; I left my computer on the airplane and it’s gone?”

Authentic relationships of trust require transparency and engagement of the whole person as opposed to showing or sharing one side of life with our victories only.

Sociable robots are widely accepted and loved in Japan due to the influence of the Shinto sense of inanimate objects having a soul:

“The main Japanese religion is Shintoism, which has the worldview of animism to the external world. Plants, animals, rocks, as well as artificial devices and the environment possess a spiritual essence. So, robots, especially social, animal or human-like robots can easily be imagined having a soul. This is something strange to European Christian religions, which find immortal soul only in human beings, and often have only instrumental attitude to non-human entities.”

That said, the Pew Research Center cites one researcher, Stowe Boyd, who predicts that “robotic sex partners will be commonplace,” possibly as early as 2025.

Are such robots and their relationship with humans already opening the door to what

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Kurzweil calls “spiritual machines”? Kurzweil calls “spiritual machines”? Moltmann points to an eschatological reconciliation of the full realization of the *imago dei*: “The true likeness to God is to be found, not at the beginning of God’s history with mankind, but at its end; and as goal it is present in that beginning and during every moment of that history.” Moltmann covers the entire lifecycle of humans as created beings, justified beings, sanctified beings, and then glorified beings as the *imago dei* is realized.

2.3.2 Unintended meanings and consequences of the Imago Dei

The *imago dei* stands as a hope for the oppressed in the world, both in the past and today. It serves as a liberating narrative to humanity, which is perpetually locked in the struggle against inhumane powers and systems. For instance, using the Deuteronomic Creed as a model, liberation of Israel from Egyptian slavery and hard labor (cf. Deut. 26:5b-11), Dalit (the outcastes of India’s caste system) theologians can construct the historical Dalit consciousness. Dalit consciousness has to do with roots, identities, the struggle for human dignity, and “for the right to live as free people created in the image of God.” Nirmal says:

“The historical Dalit consciousness depicts even greater and deeper pathos than is found in the Deuteronomic Creed. My Dalit ancestors did not enjoy the nomadic freedom of the wandering Aramean. As outcasts, they were also cast

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out of their villages. When my Dalit ancestors walked the dusty roads of his
village, the Sa Varnas tied a branch of a tree around his rest so that he would not
leave any unclean footprints and pollute the roads.”

The Dalit consciousness should realize that the ultimate goal of its liberation
movement cannot be the “land flowing with milk and honey.” For Christian Dalit
Theology, it cannot be simply the gaining of rights, the reservation, and the privileges.
The goal must be the realization of full humanness or, conversely, full divinity, the ideal
of the imago dei, the image of God in us. To use another biblical category, our goal is the
“glorious liberty of the children of God.”

Stanley Hauerwas and Samuel Wells point to Christian worship as the disarming
practice, characterizing humans not as strangers competing for limited resources, but as
fellow pilgrims:

“unless this story of the modern self is questioned, ethical recommendations for
racial reconciliation may unwittingly reproduce the same politics of anxiety. That
is what makes an ethics of “tolerance” problematic. For it reproduces a
problematic form of inclusion by which power and privilege are extended but
not questioned. In this way, white privilege may be extended to black folks
without, however, questioning the underlying politics and accounts of the self
and of human flourishing that are responsible for giving rise to the problem of
racism in the first place. What is required if such a politics is to be resisted is an
altogether different story of the self, a different politics in which the self is
“relieved,” so to speak, of the need to provide the grounds for its own existence
or to prove its importance. The relief can only come to the extent that the self is
not at the center of life. Christian worship is precisely the performance of this
different story, which draws the self into the wider story of God’s creation and

redemption. In other words, if modern anthropology, in which the theories and practices of racism are at home, is an “arming” strategy, Christian worship is a “disarming” practice. That is what being greeted “In the name of the Father, and of the Son, and of the Holy Spirit . . .” does. For the greeting is an invitation to the Christian to “relax,” as it were, in the knowledge that his or her life needs no other grounds for its justification since it has already been justified and the Christian is already part of that new creation that is made possible by “the love of God, the grace of the Son and the fellowship of the Holy Spirit.” Becoming thus aware of, and learning to relax in, this good news Christians can now be aware of other Christians—not as strangers competing for limited resources, but as fellow pilgrims, fellow citizens of this new creation.”

Lynn White Jr. blames the doctrine of the *imago dei*’s “dominion factor” for the environmental crisis humans face today. Concerning the Genesis creation account of the image, he contends that it resulted in treating nature as something created for the pleasure and purposes of the agents of God, namely, humanity. Stuart L. Pimm, Doris Duke Professor of Conservation Ecology at Duke University’s Nicholas School of the Environment says, “I’m a believing Christian. ‘God so loved the cosmos that he gave his only son.’ That’s an injunction from St. John. To me, this says that Christians have an obligation to look after the world—stewardship. We cannot pointlessly drive species to extinction and destroy forests and oceans. When we do that, we are destroying God’s

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creation." Can AI help us understand ourselves better? And, in turn help us better conserve the creation of God?

Other creatures have exceeded human achievements in their own specific expertise. Cheetahs, springboks, and lions, among other land animals, are faster than humans. Man-made cars and trucks are faster than humans. Today’s AI machines are better than humans, doing calculations and playing chess or Go, but does that mean they will gain the life, consciousness, and awareness that are part of being human? AI certainly confronts the Christian view of the \textit{imago dei}.

What if they are successful in creating AI in the image of humans? In this case, is the \textit{imago dei} of AI possible? What unique characteristics of human character, as defined by the \textit{imago dei}, might be threatened by AI? The next chapter focuses on whether symbiosis of the \textit{imago dei} with AI is possible. If so, what will that entail? The discussion moves to the ethics of AI in the presence or absence of such symbiosis. If humans are different from AI, then what are those differences? How should humans relate to AI in the context of the human \textit{telos}? What is the \textit{telos} of AI? Who gets to decide on such a \textit{telos}?

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3. AI and life forms

Descartes maintains that there is fundamental rupture between the human, animal, and machine. In relation to the machine, Descartes starts by recognizing that humans can make machines. The problem is, however, that the machine is simplistic in comparison to the complexity of human beings. In short, the machine is objective and runs according to programmed ends, whereas the human is organic and capable of spontaneous action, which not only gives the human being a different flow than machines, but also means humans can easily spot machines that look like humans.\(^{131}\) Once the machines pass the Turing test this statement will be proved false, but it is true that machines, even today, run to their programmed ends. Heidegger links being to time and hence shows that being is not fixed but is “essentially” becoming.\(^ {132}\) Heidegger steps back to consider humanity through the question of being. As a consequence, he comes to a particular revelation: rather than being defined by its difference from other entities, a human being is defined in relation to “being,” in that it, and it alone out of all entities, exists in the open clearing of being.\(^ {133}\) Donna Haraway contends that technology shapes

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\(^{133}\) Ibid, 226.
every aspect of human life, and human identity becomes fluid, being shaped by technocultural forces. One cannot be cut off from their influence. She says,

Late twentieth-century machines have made 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 organisms and machines. Our machines are disturbingly lively, and we ourselves frighteningly inert.

We now turn attention to discuss issues related to the fluidity and symbiosis of technology and lifeforms.

3.1 Soil and Silicon (Si)

The closeness, and yet enmity, between humans and creation is highlighted by the play on words between ādām either as “human being,” or the first male individual, and ādāmā, “ground, earth.” It is from ādāmā that ādām is fashioned (Genesis 2:7). The latter’s task is to till the earth (2:6). When ādām disobeys Yahweh, the ādāmā is cursed (3:17–19). This in turn causes hardship for ādām. The end of ādām is again to return to the ādāmā (parallel to āpār “dust”). This wordplay continues through the flood story and is highlighted in 4:11–12 and 5:29. The link between ādām and ādāmā in terms of sin

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and curse is only alleviated in 8:21–22. The dependence of fertility on human behavior, which remains wicked (8:21; 9:18–27; 11:1–9), is broken.

While the wordplay between ādām and ādāmā is unique to the biblical material, the notion that humans are in part formed from earth or clay was widespread in the ancient Near East. We find it in the Sumerian account of the creation of humans, where Enki, in order to fashion servants for the gods, calls on Mammu to “mix the heart of the clay that is over the abyss.”  

Likewise in the story of Atrahasis, Ea assists Mami, “the mistress of all the gods,” in fashioning humans by pinching off pieces of clay. The creation account in Genesis 1 depicts both the spiritual and material elements of human beings. God breathing the breath into humanity gives it a soul, spirit, and life, which are permanent through eternity, with the body as a temporary abode. The body as a temporary abode has a special relationship with soil. Therefore, it is necessary to discuss the importance of soil, then briefly discuss similarities and differences with silicon (material used to develop computational chips that support AI and other forms of computer programming).

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Soil science studies soil as a natural resource on the surface of the earth; it includes soil formation, its classification and mapping, the physical, chemical, biological and fertility properties of soils, and showing these properties in relation to the use and management of soils. Closer examination of soil shows that it has creatures crawling through it. Complex structures exist in soil, with pores and channels for water, and different colors and shapes and particles. Macroinvertebrates, bacteria, and fungal hyphae are all present in soil. Soil comes in brown, red, black, orange, and even blue colors. In the U.S. alone, soil is classified in twelve types. This classification was done by Guy Donald Smith, former director or the US Department of Agriculture’s soil survey investigations. Alfisol is soil with aluminum and iron, Andisol is volcanic ash soil, Aridisol is dry soil, Entisol is sediments found around rivers; the list goes on.

In Genesis 1:9 we read about the formation of dry ground: “And God said, ‘Let the water under the sky be gathered to one place, and let dry ground appear.’ And it was so.”

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Even today, scientists are unable to explain the mysterious qualities of water.\textsuperscript{141}

Whereas in Genesis 2:4-7, we see its more intimate interaction with dry ground and soil:

“This is the account of the heavens and the earth when they were created, when the LORD God made the earth and the heavens. Now no shrub had yet appeared on the earth and no plant had yet sprung up, for the LORD God had not sent rain on the earth and there was no one to work the ground, but streams came up from the earth and watered the whole surface of the ground. Then the LORD God formed a man from the dust of the ground and breathed into his nostrils the breath of life, and the man became a living being.”

Adamah (Hebrew: הָדָם) is also translatable as ground. So, Adam came from “adamah”, or the ground. This reinforces humankind’s role in cultivating the earth as well as its origins from the dust.\textsuperscript{142} God breathes life into dust to make humans. We are God-breathed or God-inspired creatures. Not only are humans molded from soil and given life from God’s breath, we read in Genesis 2:15 the vocation humans are given in terms of their responsibility to the soil: “The Lord God took the man and put him in the garden of Eden to till it and keep it.”

Soil, the material from which humans are made, becomes the vocation of humankind, the vocation to serve and protect it. In Latin, the word for dust is humus which happens to be the root word for humility. As creatures, we came not only from


\textsuperscript{142} Ithamar Grinvald, Rituals and Ritual Theory in Ancient Israel (Atlanta: Society of Biblical Literature, 2003), 60.
dust, but the nature of that word in Latin leads one to the idea of humility. After the flood, the covenant God makes with Noah in Genesis 9:16-17 is a covenant made with every living creature and not just with mankind:

“When the bow is in the clouds, I will see it and remember the everlasting covenant between God and every living creature of all flesh that is on the earth.” God said to Noah, “This is the sign of the covenant that I have established between me and all flesh that is on the earth.”

Soil has the quality of resurrection in it. It is an organic decomposition system whereby millions of plants and trees die in it, yet death is quietly absorbed, and then the earth produces other organisms. Speaking about the recovery of soil from above-ground nuclear testing and cotton farming in the Piedmont area of North Carolina, Dan Richter, of Duke University’s Nicholas School of the Environment and Earth Sciences, comments, “You can see the brown and black organic matter coming back. The topsoil is being rebuilt by the forest after the plow destroyed it for more than a hundred years.” Wendell Berry puts it best: “The soil is the great connector of lives, the source and destination of all. It is the healer and restorer and resurrect-or, by which disease passes

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into health, age into youth, death into life.”  

Meanwhile, materials from the finest sand have given humankind the ability to create silicon chips that power AI. Biological intelligence comes from the same soil as AI. Graeme Finlay reflects on how the randomness of natural processes achieves God’s creative purpose:

“To the Christian it is axiomatic that each one of us is a created being (Psalm 139). Scientifically, we are the product of random genetic process. Theologically, we are the outcome of loving divine purpose. Molecular randomness (in scientific terms) and createdness (in theological terms) inevitably go hand-in-hand.”

The Christian notion of human beings having a body (Matthew 6:22), mind (psyche; Romans 12:1-2), and spirit (pneuma; 1 Corinthians 2:11) can be equated to physical, nonphysical, and supernatural aspects, respectively. Science, including biotechnology, has not been able to address the nonphysical attributes of human beings. To be living, conscious, and rational are keys to humankind and are beyond the categories of simply being physical. Meanwhile, God has no history; he is outside the bounds of time as we experience it, and so he experiences the whole of reality as an eternal “now.” Hebrews 1:3 describes God as a supernatural being that is omniscient and sustains His creation. Human consciousness is a “just-in-time” awareness of our life

146 Wendell Berry, *The Unsettling of America: Culture & Agriculture* (Magnolia, MA.: Peter Smith, 1997).
and environment. We only experience snapshots and flashbacks of reality. God is out of
the time continuum in which humans are locked. God is not temporal. He is beyond
time. Thomas Aquinas offers several arguments in support of this conclusion. The first
argument goes:

1. Whatever exists in time can be computed according to its befores and afters.
2. Changeless being, as God is, has no befores or afters; it is always the same.
3. Consequently, God must be timeless.

Time is duration characterized by substantial and accidental changes. A
substantial change is a change in what something is. Fire changes what a piece of wood
is. An accidental change is a change in what something has. Growing knowledge is an
accidental change in a being. Aquinas sees three levels of being in relation to time and
eternity:

1. God in eternity is Pure Actuality, without essential or accidental change.
2. Angels and saints who dwell in the spiritual world of heaven live in
   aeviternity (or aevum).
3. Human beings, comprising soul and body, form, and matter, live in time.

Eternity (God) endures without any potency. Aeviternity (angels) endures with
completely actualized potency. Their changes are not essential but accidental. Spiritual
beings in aeviternity do not change in their essence, though they do undergo accidental
changes. Angels increase in knowledge by divine infusion, and they have

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changeableness with regard to choice, intelligence, affections, and places. But with no substantial changes in *aeviternity*, angels are immutable in their level of grace and charity. What is true of the angels is also true of the elect in heaven. Time (humanity) endures with progressive actualized potency.

The second argument for God’s eternity similarly follows from immutability. It begins with the premise that whatever is immutable does not change in the state of its being. Whatever is in time goes through a succession of states. So, whatever is immutable is not temporal. This argument stresses another aspect of time: whatever is temporal has successive states, one after the other. God does not, so he is not temporal.

Total immutability necessarily implies eternity. For whatever changes substantially is in time and can be computed according to before and after. Whatever does not change cannot be in time, since it has no different states by which before and after can be computed. It never changes. Whatever does not change is not temporal. Not only is God eternal, but he alone is eternal, for he alone is essentially immutable.

Aquinas distinguishes eternity from endless time. First, whatever is essentially whole (eternity) is essentially different from what has parts (time). Eternity is now,

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149 Ibid, 1a.10.6.
151 Thomas, *Summa Theologica*, 1a.10.2.
152 Ibid, 1a.10.3.
153 Ibid, 1a.10.4.
forever; time includes past, present, and future, now, and then. The implication of this is that God’s eternity is not divided; it is all present to him in his eternal now. So it must be essentially different from time in successive moments. Second, endless time is just an elongation of time. But eternity differs qualitatively. It differs essentially, not merely accidentally. Eternity is an essential, changeless state of being that transcends moment-by-successive-moment reality. Time measures that reality, or rather the stage on which reality plays out.

Third, an eternal being cannot change, whereas time involves change. Accounting for change, the measurements of before and after can be made. Whatever can be computed according to before and after is not eternal. Endless time can be computed according to before and after. Hence, endless time is not the same as eternity. The eternal is changeless, but what can be computed by its before and after has changed. It follows, then, that the eternal now cannot live in relation to endless befores and afters.

Obviously, Aquinas saw a crucial difference between the “now” of time and the “now” of eternity. The now of time is movable. The now of eternity is not movable in any way. The eternal now is unchanging, but the now of time is ever changing. There is only an analogy between time and eternity; they cannot be the same. God’s now has no past or future; time’s now does.

154 Ibid, 1a.10.4.
Some have mistakenly concluded that Aquinas did not believe in God’s duration for eternity, because he rejected temporality in God. Aquinas argued that duration occurs as long as actuality exists. But eternity, *aeviternity*, and time endure in different ways.

It follows, therefore, that the essential difference in the quality of the duration in time, *aeviternity*, and eternity comes from the condition of the actuality. God is Pure Actuality. Angels have received total actuality from God in their created spiritual forms. Human beings progressively receive actuality in both spiritual form and material body.

Since God endures without potentiality, he cannot endure progressively. He endures in a much higher way—as Pure Actuality. Physical science can develop its study of nonliving “dust.” However, science has yet to transcend its limitations into the life-giving breath of God, which molded clay into a living being. Even Paul struggles to correctly depict who we will be:

“Thus, it is written, ‘The first man Adam became a living being’; the last Adam became a life-giving spirit. But it is not the spiritual that is first but the physical, and then the spiritual. The first man was from the earth, a man of dust; the second man is from heaven. As was the man of dust, so are those who are of the dust; and as is the man of heaven, so are those who are of heaven. Just as we have borne the image of the man of dust, we will also bear the image of the man of heaven,” (1 Cor. 15:45–49).

Yuval Harari predicts that *homo sapiens* will be transformed into *homo deus*:

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“Techno-humanism agrees that Homo sapiens as we know it has run its historical course and will no longer be relevant in the future but concludes that we should therefore use technology in order to create Homo deus—a much superior model. Homo deus will retain some essential human features but will also enjoy upgraded physical and mental abilities…Since intelligence is decoupling from consciousness, and since non-conscious intelligence is developing at breakneck speed, humans must actively upgrade their minds if they want to stay in the game.”\textsuperscript{156}

David Pearce, Co-founder of the World Transhumanism Association, believes human-technology symbiosis will “ease the suffering of the entire biosphere. Whereby, lions lie down with lambs.”\textsuperscript{157} As seen in chapter 1, many of the narratives of metahumans and transhumanism end up in visions of dystopia. Performing the \textit{imago dei}, in a sense, is to be cultivating (as in the garden) and creating. Tim Keller talks of culture-making as “… getting hands dirty. And God formed man from the dust of the ground and breathed into his nostrils the breath of life (Genesis 2:7).” The contrast with all other ancient creation accounts could not be greater. In most creation accounts, creation is the byproduct of some kind of warfare or act of violence. Virtually never is the creation deliberate and planned. Secular scientific accounts of the origin of things are, interestingly, almost identical to the older pagan ones. The physical shape of the world, as well as creatures’ biological composition, is the product of violent forces. Unique among the creation accounts, the Bible depicts a world that is brimming with

\textsuperscript{157} Jønathan Lyons, “Abolition Is Imperative in Kurzweil’s Sixth Epoch Scenario,” 2013, \url{https://ieet.org/index.php/IEET2/more/lyons20130525}.
dynamic, abundant forms of life that are perfectly interwoven, interdependently and mutually enhancing and enriching. The Creator’s response is delight. He keeps repeating that it is all good. When God creates human beings, he instructs them to continue to cultivate and draw out the vast resources of creation like a gardener does in a garden. “Go, keep this going,’ the creator seems to be saying in Genesis 1:28, “Have a ball!”

3.2 From soil to cyborg?

Philip Hefner has popularized the term “created co-creator” and has characterized it in three parts:

“A. The Human being is created by God to be a co-creator in the creation that God has brought into being and for which God has purposes.

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

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

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The creative evolutionary process in humans that Hefner speaks about goes beyond biology (and the making of other humans) to technological and cultural creations. Karen O’Donnell’s thought experiment poses this question:

“What does it mean, then, to be in the image of God? Being in the image of God is not contingent upon human DNA or participation in a particular biological species, but rather about orientation toward the image in the other and chosen performativity of this orientation.”¹⁶⁰

Such a thought experiment is based on Philip Hefner’s breaking down of boundaries among humans, nature, and technology and then asserting:

“That humans and technology are set for nature’s possibilities. Humans are not what they used to be, so anthropocentrism is not the same, either. The religion of cyborgs and technosapiens, therefore, is also a religion of nature. If we speak in Jewish-Christian-Muslim terms, we must say that technosapiens is creation and cyborg is created in the image of God. If we subscribe to Religious Naturalism, we will have to say that technology is as much a dimension of the natural as the sea, the landscape, the biosphere and other elements of the evolutionary process. Technology is now a phase of evolution, and it is now creation, a vessel for the image of God.”¹⁶¹

O’Donnell argues that the crossing of boundaries is nothing new in Christianity. Mary is both virgin and mother, and her hybrid state is highly exalted (Luke 1:46-55).

Eucharistic theology speaks of bread and wine integrated in the body of Christ. Being comprised of two things (human and technology), being cyborg, can still be a holistic

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experience. Traditional anthropologies will struggle with this idea on many levels. The metaphors, parables, and imagery in the scriptures are not directly interpretable in the realm of the cyborg breathing or becoming human.

The term cyborg (short for Cybernetic Organism) originated among NASA scientists to create a cross between human-nature (organic) and techno-nature (biomechatronic). Cyborgs would be created to withstand environments that are hostile to ordinary humans. The cyborg is a joining of hardware with human wetware.

Since the 1990s a handful of such “joinings” have been conducted by neurologists on humans. In a non-neurological sense, humans have been cyborgs since the first artificial prostheses. In that respect, Long John Silver was a cyborg. Artificial limbs, pacemakers, implantable insulin pumps, all of these are machines that replicate or replace the function of human body parts. As far as neurological cyborg developments, in 1963 a scientist at Oxford University reported he had found a way to control a slide projector using human brain waves. Also, around the same time, Yale University neuroscientist Jose Delgado developed a radio-controlled brain implant called Steimociver that could pick up neural signals and deliver shocks to the cortex. Delgado

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became famous when he stepped into the ring with a red cape to incite a bull.\footnote{John A. Osmundsen, “‘Matador’ With a Radio Stops Wired Bull,” 1965, https://sites.google.com/site/mcrais1/delgado.} As the animal came close, Delgado pressed two buttons on the device that slowed the animal to a halt, then the second made the animal turn and go away. Later on, scientists threw out this experiment as a publicity stunt.\footnote{Timothy C. Marzullo, “The Missing Manuscript of Dr. Jose Delgado’s Radio Controlled Bulls,” \textit{Journal of Undergraduate Neuroscience Education (JUNE): a Publication of the Faculty for Undergraduate Neuroscience (FUN)} 15, no. 2 (2017), https://www.ncbi.nlm.nih.gov/pubmed/28690447, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5480854/.} Another neurosurgeon, Phil Kennedy, called his invention the neurotrophic electrode. His breakthrough came when he affixed the tips of Teflon-coated gold wires inside a hollow glass cone. In the same tiny space, he inserted another crucial component: a thin slice of sciatic nerve. This crumb of biomaterial would serve to fertilize the nearby neural tissue, enticing microscopic arms from local cells to unfurl into the cone. Instead of plunging a naked wire into the brain cortex, Kennedy would coax nerve cells to weave their tendrilled growths around the implant, locking it in place like a trellis snarled in ivy. For human subjects he would replace the sciatic nerve with a chemical cocktail known to stimulate neural growth. The glass cone design seemed to be beneficial, in that researchers could leave it in the brain for long stretches of time to monitor the brain’s electric chatter. After years of animal testing, Kennedy’s
cone electrodes received FDA approval to test on humans who had no other way to move or speak.

Riding on the success of his earlier patient, Johnny Ray, Kennedy put brain implants on two more patients. One patient’s incision did not close, and the implant had to be removed. The other patient’s disease progressed so rapidly that there was no sense in implanting electrodes in his brain. Ray also died from a brain aneurysm in the fall of 2002. After losing FDA approval on the procedure and facing a lack of funding and progress, Kennedy decided that the only way to advance the project was to tap into a healthy human brain with the electrode he had developed to enhance the brain. He made himself the subject of such an experiment. He hired a surgeon in Belize, a country with loose medical safety and efficacy standards, to open his skull and implant his electrode (shown below).

![Brain Implant Electrode - Photo by Dan Winters](image)

**Figure 3-1: Brain Implant Electrode - Photo by Dan Winters**

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The surgery went well without any snags or much bleeding, but two days after the surgery, when his surgeon tried to interact with Kennedy, his jaw began to grind, and chatter, and his hands began to shake. The surgeon got worried that the seizure would break Kennedy’s teeth. When given a pen, Kennedy could not make any sense, either, writing random letters all over the page.

![Figure 3-2: Electrode Implant - Illustration by Francesco Muzzi](image)

After 88 days of suffering Kennedy went under the knife with a local doctor in Atlanta to remove the apparatus that would have made his brain more powerful and made him into a first of a kind Cyborg. Kennedy is still alive but with garbled speech and a drooping face on the side of the skull where the incision was made to install the electrode.

Most recently, Elon Musk has invested $39 million to build another company called NeuraLink, which boasts:

“The brain-computer interface venture is based on creating devices that can be implanted inside the human brain. Its objective is to help humans merge with

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167 Engber, “The Neurologist Who Hacked His Brain — and Almost Lost His Mind.”
software. This would thus help bring humans on par with the advancements in AI. In the longer run, this could result in an improvement of memory in humans. Moreover, it could allow interfacing with computers in the coming times and thus making communication easier and much more efficient.”

Musk, inspired by Iain Banks’ culture series of science fiction novels, expects to put thousands of electrodes in the brain to augment intelligence with AI. For example, one could simply download a calculus chip into the brain to be a calculus guru. The same with flying a helicopter, Musk’s helicopter chip download would let anyone with no knowledge or training of helicopters fly them safely. Professor Krishna Shenoy is not so sure; he likens our understanding of the brain to humanity’s grasp of the world map in the early 1500s. Another professor, Jeff Lichtman, is even harsher. He starts off his courses by asking his students the question, “If everything you need to know about the brain is a mile, how far have we walked in this mile?” He says students give answers like three-quarters of a mile, half a mile, a quarter of a mile, etc.—but that he believes the real answer is “about three inches.”

In a conversation with Jack Ma of Alibaba, Elon Musk insisted that we all are cyborgs already. He came to this conclusion based on the fact that most of the

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population is addicted to screens on their mobile and desktop devices. It would be like saying someone is whiskey because they are addicted to alcohol.

3.3 Breath of God

Something happened in the universe and in humanity when God breathed his breath on it. The spirit that hovered over the waters in Genesis 1 is equated to the breath of God that He breathed into the mold of clay in the garden of Eden. The same spirit that brought order to chaos, formed the nuclei of the primordial elements hydrogen and helium and the first atoms, saw the birth of galaxies and stars, and developed the universe and solar system around our sun, also made the strands of DNA embedded in every living organism, along with humans and our vastly complex brains. The breath of God giving and sustaining life is found throughout the Bible. Hebrew “ruach” can mean wind, breath, or spirit. As already noted in Genesis 2:7, through the breath of God humans became living beings. Genesis 6:3 says, we will live so long as the breath of life is within us, making humans living beings and giving them a soul. In Genesis 6:17 and 7:22 God warns that the flood will “destroy from under heaven all flesh in which is the breath of life.” In Genesis 7:15, Noah is instructed to take “two of all flesh in which there is breath of life.” In Job 33:4, Elihu says: “The spirit of God has made me, and the breath

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170 China Global Television Network, Live: Jack Ma and Elon Musk’s AI Debate in Shanghai, accessed February 18, 2020, https://www.youtube.com/watch?v=uJ5w11Cm3gM.
of the Almighty gives me life.” Job 34:14-15 warns, “If he should take back his spirit to himself, and gather to himself its breath, all flesh would perish together, and all mortals return to dust.” Ecclesiastes 12:7 says, “and the dust returns to earth as it was, and the spirit returns to God who gave it.” The Psalms, throughout, bear imagery of God’s breath and word, which have the force of creativity and power behind them: “By the word of the LORD the heavens were made, and by the breath of his mouth all their host,” (Psalm 33:6).

“These all look to you, to give them their food in due season. When you give it to them, they gather it up; when you open your hand, they are filled with good things. When you hide your face, they are dismayed; when you take away their breath, they die and return to their dust. When you send forth your Spirit, they are created, and you renew the face of the ground,” (Psalm 104.27-30).

“And he said to me, “Son of man, can these bones live?” And I answered, “O Lord God, you know.” Then he said to me, “Prophesy over these bones, and say to them, O dry bones, hear the word of the LORD. Thus says the Lord God to these bones: Behold, I will cause breath to enter you, and you shall live. And I will lay sinews upon you, and will cause flesh to come upon you, and cover you with skin, and put breath in you, and you shall live, and you shall know that I am the LORD,” (Ezekiel 37:3-6).

Although brain implants are commonplace for deep brain stimulation for Parkinson’s disease,171 we have yet to see successfully functioning brain communication

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implants. Imagine the difficulty of creating a whole human. David F. Siemens asks a brilliant question in response to Graham Finlay’s randomness of natural processes:¹⁷²

“‘Then the Lord God formed man of dust from the ground and breathed into his nostrils the breath of life; and man became a living being’ (Genesis 2:7). Physical science has successfully developed paradigms to study nonliving ‘dust’. However, can science make the ‘breath’ of God part of its subject matter? Is the concept of life so elusive that it becomes scientifically indefinable? Perhaps the inability of nonliving matter to detect and identify life as well as consciousness indicates that only life itself can “detect” and know life. Similarly, only self can “detect” and know self. Consciousness presupposes rationality, rationally presupposes life, and life presupposes God. Human rationality and consciousness are used to know nature and God, yet paradoxically humans may be unable to formulate a scientific theory either of life or of self.”

From this it follows that strong AI expects the production of an image of the fallen image and likeness of God. Would this produce a mortal apparatus or an immortal one? Would the possibility of exchangeable parts and updating programs give it improved and unending existence? There is also a vital difference between a device that can perform a range of specific tasks more rapidly and accurately than humans can and one that can self-consciously make moral decisions. Can the machine comprehensively improve on the imitated person? A further question raised would be

whether digital hardware, the current option, can even adequately emulate analog wetware, even if this is all there is to consciousness.\textsuperscript{173}

### 3.4 Morality in body or in soul?

On the extreme end of the argument, Richard Dawkins writes:

We are machines built by DNA whose purpose is to make more copies of the same DNA … This is exactly what we are for. We are machines for propagating DNA, and the propagation of DNA is a self-sustaining process. It is every living object’s sole reason for living.\textsuperscript{174}

Phineas P. Gage (1823–1860) was an American railroad construction foreman remembered for his improbable\textsuperscript{175} survival of an accident in which a large iron rod was driven completely through his head, destroying much of his brain’s left frontal lobe.\textsuperscript{176} Gage’s mouth was open at the moment of the explosion, and the front and back of his skull temporarily "hinged" apart as the iron entered from below, then were pulled back together by the resilience of soft tissues once the iron had exited through the top of Gage’s head.\textsuperscript{177}


\textsuperscript{174} Richard Dawkins, Growing Up in the Universe (W W Norton & Co Inc, 2006).

\textsuperscript{175} Henry Jacob Bigelow, Dr. Harlow’s Case of Recovery from the Passage of an Iron Bar through the Head (Philadelphia: T.K. & P.G. Collins, Printers, 1850).


Figure 3-3: Phineas Cage’s Iron Rod Injury

The pre-accident Gage was hard-working, responsible, and "a great favorite" with the men in his charge; his employers regarded him as "the most efficient and capable foreman in their employ." His doctor took pains to note that Gage's memory and general intelligence seemed unimpaired after the accident, outside periods of delirium.

The post-accident Gage seemed to lack equilibrium or balance, so to speak, between his intellectual faculties and his animal propensities. He was fitful, irreverent, indulging at times in the grossest profanity (which was not previously his custom), manifesting but little deference for his fellows, impatient of restraint or advice when it

conflicts with his desires, at times pertinaciously obstinate, yet capricious and
vacillating, devising many plans of future operations, which are no sooner arranged
than they are abandoned in turn for others appearing more feasible. A child in his
intellectual capacity and manifestations, he had the animal passions of a strong man.
Previous to his injury, although untrained in the schools, he possessed a well-balanced
mind, and was looked upon by those who knew him as a shrewd, smart businessman,
very energetic and persistent in executing all his plans of operation. In this regard his
mind was radically changed, so decidedly that his friends and acquaintances said he
was "no longer Gage."\(^{180}\)

Gage raises an important question: where does the moral compass in humanity
lie? Are we all body and mind, powered by the brain, or do we have a soul in addition
to the body? Dallas Willard defines the soul as “the hidden or ‘spiritual’ side of a
person.” He further explained that the soul includes an individual’s thoughts, feelings,
and will, as well as an individual’s bodily life and social relations, which are all
“hidden” aspects of our being. The soul is that aspect of our whole being that pulls
everything together. The life center of human beings, the soul seeks to integrate our will
(our capacity to choose), our mind (our thoughts and feelings), and our body (our little

\(^{180}\) John M. Harlow, “Recovery from the Passage of an Iron Bar through the Head,” *History of Psychiatry* 4, no.
'power packs' filled with appetites and habits) into a complete person. In another book, he offers better clarity, “[It] is like the silent, invisible yet necessary Central Processing Unit (CPU) of our person. Our soul, and thus our soul’s health, is the driving force behind everything that matters to us.” John Ortberg defines the soul as “the eeriest, most mysterious, most evocative, crucial, sacred, eternal, life-directing, fragile but indestructible, and now-a-days quite controversial part of your existence.” So, how does this definition of the soul constitute being human? Does integration of the human body or mind with technology somehow compromise our essential humanity? Joel B. Green provides an extensive survey of this topic in his book, “In Search of the Soul: Four Views of The Mind-body Problem.” He provides generous categories and the help of expert philosophers to debate these issues, including reductive materialism,

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185 Reductive materialism is the view that the human person is a physical (or material) organism whose emotional, moral and religious experiences will ultimately be explained by the natural sciences. Joel B. Green in Joel B. Green, Stuart L. Palmer, and Kelvin Corcoran, *In Search of the Soul: Four Views of the Mind-Body Problem*, Kindle ed. (2005), 13.
dualism,\textsuperscript{186} and holistic dualism.\textsuperscript{187} Stewart Goetz defends the traditional view of the soul as an immaterial substance with essential psychological powers and capacities.\textsuperscript{188} W. Hasker suggests that the soul emerges substantively and naturally when the right configuration of matter and neural stuff is present.\textsuperscript{189} N. Murphy argues for a physicalist understanding of personal creatures as having moral capacities made possible by biological and neurological processes but who are nevertheless irreducible to these material parts.\textsuperscript{190} Finally, K. Corcoran proposes that human persons are agential selves who are constituted by, but not identical with, their bodies.\textsuperscript{191} In the opening salvo of his book Green shifts attention from the origin of humans to the mind-body problem, posing an important question: “How can an immaterial soul influence, perhaps control, a material body?” Drawing on Augustine he writes, ”Some people read books in order to find God. But the very appearance of God’s creation is a great book. Ponder heaven and earth religiously.”\textsuperscript{192} Take science seriously on account of the doctrine of creation.\textsuperscript{193} In

\textsuperscript{186} Radical dualism is the view that the soul (or mind) is separable from the body, having no necessary relation to the body, with the human person identified with the soul. Green, Palmer, and Corcoran, \textit{In Search of the Soul: Four Views of the Mind-Body Problem}.

\textsuperscript{187} Holistic Dualism in its various renditions qualifies as a form of substance dualism, but it posits that the human person, though composed of discrete elements, is nonetheless to be identified with the whole, which then constitutes a functional unity.

\textsuperscript{188} Green, Palmer, and Corcoran, \textit{In Search of the Soul: Four Views of the Mind-Body Problem}, 36.

\textsuperscript{189} Ibid, 109.

\textsuperscript{190} Ibid, 115-22.

\textsuperscript{191} Ibid, 159.

\textsuperscript{192} Karlfried Froehlich, “‘Take up and Read’: Basics of Augustine’s Biblical Interpretation,” \textit{Interpretation} 58, no. 1 (2004): 5–16.

\textsuperscript{193} Green, Palmer, and Corcoran, \textit{In Search of the Soul: Four Views of the Mind-Body Problem}, 15.
summarizing all four positions, Stuart Palmer tries to find common ground in the
Christian practices of hospitality and forgiveness. He is right in criticizing Nancy
Murphy’s view that “we are no more than chemistry,” writing:

“A reduction of personhood to simply a physical organism understood in terms
of basic biology and nothing more would result in a theory aligning more with a
modern hospitality, or worse! If we are no more than our basic chemistry, why
not focus primarily on sustaining the biological organism and minimize the
moral value of assisting others; or of conveying dignity, worth and value to the
stranger; or of engaging in personal and relational fellowship and community
with those in need of food, clothing and protection? I would assume Murphy
would affirm a traditional understanding of Christian hospitality, but her doing
so requires a convincing prophylactic against charges of radical reductionism;
otherwise, she, like Goetz and Hasker, would need to find a way to embrace the
grander points of the Christian narrative and tradition that have conferred on the
human being inherent value and worth because of being made in God’s image.
The question for all three positions, though, remains whether it is sufficient to
have a Christian anthropology that does not carry within itself the impetus for
care for the other.”\(^{194}\)

Whatever our metaphysical makeup, if God deems it good for us to assist and
value others, then it is good indeed. In the creation ethic, being created in the image of
God, we must value the whole person, body, mind, and soul. Having adequate food,
shelter, and clothing in the context of hospitality and forgiveness are key to human
flourishing. In this case, morality is more “built-in” to human nature than any of the
four views could accommodate. Corcoran argues: “The metaphysics of persons are

\(^{194}\) Ibid, 202.
neutral with respect to a wide variety of matters and the relevant issues can be decided only by introducing distinctly moral principles such as God’s intentions.”

God’s creatures are totally different from our creatures—meaning Cyborgs and AI can exist without “ruach,” breath. Given our limitations, our creation is purely physical in nature. The purely physical nature of AI aligns with the “materialistic” view of the new atheists. David Bentley Hart argues that the new atheism fits very well with the spirit of our shallow, consumer civilization. "Such a society is already implicitly atheist... It cannot allow ultimate goods to distract us from proximate goods. Our sacred writ is advertising, our piety is shopping, our highest devotion is private choice.”

Playing on Marx’s critique of Christianity, Hart says the new atheism is "the opiate of the bourgeoisie, the sigh of the oppressed ego, the heart of a world filled with tantalizing toys... the triviality of the movement is its chief virtue.”

Commenting on the fallacies of the new atheists, Hart says, "nothing in the cosmos contains the ground of its own being." Yet, "it cannot possibly be the case that there are only contingent realities,” unless we settle for an infinite regress.

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195 Ibid, 172-75.
197 Ibid.
198 Ibid, 92.
199 Ibid.
Human consciousness, too, is a mystery inaccessible to materialist explanations since "the most basic phenomenology of consciousness discloses [a] vast... incommensurability between physical causation and mental events." Hart affirms that attempts to make sense of human consciousness "in materialist terms frequently devolve into absurdity and seem inevitably only to exchange one explanatory deficiency for another." Hart argues that bliss is the human longing for "goodness" and "beauty" makes little sense within the confines of a materialist metaphysic, despite materialist assertions to the contrary. He further highlights the folly in turning "from the mystery of being to the availability of things, from the mystery of consciousness to the accessible objects of cognition, from the mystery of bliss to the imperatives of appetite and self-interest." God is omniscient; there is nothing that can be thought of that he did not think of first. All human scientific achievement is really a journey of discovery of what God has woven into creation already. God is the science teacher—all the “aha” moments of

200 Ibid, 153.
201 Ibid, 169.
202 Ibid, 238-90.
203 Ibid, 331.
scientific discovery were revealed to our mind by God whether we acknowledge it or not (cf. Isaiah 28:24-29).\textsuperscript{204}

Science is known to God before humans discover it. The exploration of creation by humanity is a discovery of the glory of God already woven into the fabric of creation (Habakkuk 2:14, Isaiah 6:3). Technological achievement does not narrow the infinite gap between the Creator and us, his creatures. Humans are not called by God to be either co-creators or exploiters, but have been elected by God to assert a limited dominion over a finite and temporal creation in the name of the One whose image and likeness they bear.\textsuperscript{205} Such limited dominion provides a stimulus for purposeful human action, while also imposing limits upon those actions in line with the temporality and finitude that characterize both the purposive actors and the objects of their purposeful actions.

\textsuperscript{204} This passage outlines God’s omniscience and shows that God teaches humanity about science. He teaches us of our humanity and his creation. God knows when to plough, when to plant, and when to thresh before the farmer does.

4. Implications of AI on our planet and society

Among developed and developing societies, there is enormous enthusiasm about technology in general and Artificial Intelligence (AI) specifically. Many see it as the way forward, towards a world free from technical incompetence—no traffic jams, no delays at airports, and no overcrowded subway stations. Slightly more skeptical observers, however, notice the dangers in surrendering a large percentage of human activity to machines. Aside from the most obvious dangers such as labor displacement and technical malfunctions, the rise of technology and AI poses a more fundamental question: what will be the impact of technology and self-learning machines on human society? This chapter will focus on that question, emphasizing the economic and political change that might be brought about by the rise of AI. The next chapter will focus on the leadership role the Church will need to play in a world dominated by AI and governed by software.

Albert Borgmann, a philosopher at the University of Montana, has written a unique book entitled, Power Failure: Christianity in the Culture of Technology.206 His argument is that our culture is so influenced by technology that we are losing our former habits of communal celebration. However, he is not a Luddite. He contends that

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206 Albert Borgmann, Power Failure: Christianity in the Culture of Technology (Grand Rapids, MI: Brazos Press, 2003).
we should neither try to demolish technology nor run away from it. We should rather restrain and redeem it. \(^{207}\) Borgmann’s philosophical approach to technology is not hard to understand. In the first section of his writings, Borgmann starts by describing our current cultural context, likening it to Cool Whip. An artificial substitute for whipped cream, it is an example of how modern technological society has substituted the bland and artificial for the real. Borgmann challenges us to see the equivalent of Cool Whip in other products and aspects of our society. He describes our society as having a device paradigm.

In speaking of celebration, a central theme of the book, Borgmann notes how celebratory events have become less of a communal event due to our technologically oriented culture. Commercialization, via television, has made celebration more remote. Although Borgmann does not mention the Super Bowl, there is probably no better example. He argues that humanity is cheapened when celebrations exclude real participants doing things together physically.

The second section of his book is about the place of Christianity within contemporary culture. In the fourth chapter he speaks of contingency and grace. This is one of the reasons why a review of this book is relevant. Borgmann understands atheists Richard Dawkins, Daniel Dennett, and Stephen Weinberg well enough, and shows that

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\(^{207}\) Ibid, 8.
they recognize contingency in the universe. Borgmann, however, sees grace as connected to contingency. He posits that people experience different kinds of grace which eventually determine the chances in their lives. Living in a technological society, which claims to have answers to so many human needs, puts people at risk of overlooking this grace that God brings into our lives.

Borgmann also writes about how contemporary technological culture, which he calls the device paradigm, is marginalizing genuinely valuable and important parts of culture. For example, reading books is now less common. Martin LaBar says the following of Borgmann’s book:

"A unique book … [Borgmann] calls us to genuine, face-to-face celebration, as Christians and as inhabitants of culture. Such celebration takes real work and real communication, but it produces a more Christian and humane society. This is a philosophy book that does not try to win an argument. It is philosophy in the sense of examining what it means to be human and what actions this meaning should promote."208

Let’s look at what the developers of technology and AI say about the force and power of these technologies and their impact on their own friends and families: “We have unleashed a beast, but there is a lot of unintended consequences,” says Tony Fadell, inventor of the iPod and co-inventor of the iPhone at Apple. “I don’t think we have the tools we need to understand what we do every day … we have zero data about

our habits on our devices.”

Sean Parker, who was the founding President of Facebook, has publicly called himself “something of a conscientious objector” on social media and said, “God only knows what it’s doing to our children’s brains.”

Steve Jobs told reporters that his kids don’t use iPads and that “we limit how much technology our kids use at home.”

Chamath Palihapitiya, former Vice President of user growth at Facebook has said that, “I can control my decision, which is that I don’t use that shit. I can control my kids’ decision, which is that they’re not allowed to use that shit… The short-term dopamine-driven feedback loops that we have created are destroying how society works.”

Eric Schmidt, former Chairman and CEO of Google makes an audacious suggestion: “Take one hour a day and turn that thing [technology] off. I know it’s going to be hard. Shut it down. Learn where the off button is.”

As the possibility of AI looms ever closer, the Western world’s inability to grapple with its consequences has become increasingly clear. Heretofore, the most

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consequential technological invention was the printing press, which enabled empirical knowledge to usurp the place of religious doctrine as the foundation for human knowledge. Thus, humanity transitioned from an age of religion to an age of reason, which has continued to this day.\footnote{Henry A. Kissinger, "How the Enlightenment Ends," The Atlantic Monthly Group, https://www.theatlantic.com/magazine/archive/2018/06/henry-kissinger-ai-could-mean-the-end-of-human-history/559124/} Since then, machines have become increasingly powerful, as Western societies transition from agricultural to industrial societies and from industrial societies to the post-industrial societies of today. What has remained constant, however, is the human monopoly on defining the purposes and intentions of these machines. However powerful these computers, weapons, and production lines might be, humans have continued determining the ends to which their power should be used. What alarms most observers is the possibility of machine learning going one step further and developing AI, which defines the ends of the process as well as the means. The fear is that surrendering the human monopoly over the definition of purpose could well lead to an age in which humans are reliant on machines governed by algorithms, rather than religious, cultural, and ethical norms. This is true especially when we consider the litany of errors AI has delivered in last twenty years, which continue to this day:
1988: Admission software discriminates against women and minorities.  
2005: AI reschedules meetings dozens of times, each time by five minutes.  
2010 Complex Stock trading AI software causes a trillion-dollar flash crash.  
2014 A smart fire alarm fails to sound during a fire.  
2015 A robot made for picking auto parts picks and kills a man.  
2015 AI built to check passport photos reports an Asian user as having closed his eyes.  
2016 A self-driving car has a deadly accident.  
2016 The Google search engine gives racist results.  
2017 Amazon’s Alexa AI plays adult content instead of playing kids songs.  
2017 Face-beautifying AI makes black people look white.  
2018 A store assistant robot fails to help, with responses like “cheese is in the fridges.”  

4.1 Economic implications

In the sphere of economics, the power of machine learning has already been demonstrated in several spheres, including computation, analysis, and function. In finance, computer-devised algorithms far outperform humans when it comes to devising and executing trading strategies. In investment, computer algorithms are seen to be superior to humans when it comes to calculating risks and rewards, as well as assessing the overall viability of any project. Even retail companies are increasingly moving towards machines to perform basic logistical functions. By most estimates, we are likely to see a continuation of the trend towards mechanization of functional tasks, whereby digital machines outperform humans in areas where success is determined by the machine’s ability to follow pre-conceived directives consistently. That trend will cause major disruptions to existing labor systems, since around a third of all jobs in the Western world involve carrying out tasks that can be performed by robotics. An IBM study shows that 120 million workers may need to be retrained as a result of AI and intelligent automation. In other words, the majority of the workforce in the West occupies jobs where they can be outperformed by non-humans.

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But even with the onset of machines that have outshone humans when it comes to operating hedge funds, analyzing investments, or the maintenance of logistical centers, the foundation of the age of reason remains unchallenged, at least for now. Although machines have proven to be more adept at certain tasks, humans have retained their monopoly on defining the ends for those machines. First of all, the human brain remains the main source of economic creativity and the only source for conceiving the strategies that machines then carry out. Irene Aldridge notes that the use of artificial intelligence systems at Renaissance Technologies, the hedge fund started by James Simon, yielded higher returns. These systems use quantitative models generated by machine learning. As expected, computers proved to be more consistent and precise than their human counterparts. In the instance of Renaissance Technologies, the fund employed only 290 traders in 2018, despite managing more than $84 billion. But as Aldridge points out, humans still deserved all the plaudits for the initial idea. While most of the operations in the fund are run by computers, decision making remains with the managers, who decide whether to pursue short-term or long-term profits, set fundraising goals, and who, most importantly, determine which products the fund should be trading. Therefore, the current finance industry reflects the ambiguous place

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of AI in Western economies. On one hand, machine learning is outperforming humans at functional jobs across every sector. On the other hand, claims about the imminent replacement of all humans by machines in every industry may be overblown. Even the most AI-driven companies afford human beings the power to conceive of the original business idea, define the ends of the company’s strategy, and make all the key decisions on products and financial targets.

All the same, there is every danger that machine learning may soon threaten our monopoly on fundamental economic decisions. There is every possibility that machine learning will produce algorithms that define their own objectives, which they will go on to pursue with astonishing levels of precision. This scenario could culminate in the dystopian vision above: humans would live side-by-side with machines that are more powerful and that behave according to guidelines unintelligible to humanity. The economic consequences would be catastrophic, since the prioritization of computer-defined considerations would veto just about any long-term project, most of which make little economic sense but whose benefit derives from the stimulus it lends to other sectors of the economy. When studying the construction of the federal highway network in the 1950s, Tom Lewis came to the clear conclusion that the overwhelming majority of roads, bridges, and tunnels, when examined on their own, were unviable.\footnote{Kenneth T. Jackson, “Divided Highways by Tom Lewis,” \textit{Harvard Design Magazine}, no. 7 (1999).} Most state
funds would never be recouped, whether through taxes or any other form, but the expansion of infrastructure remained vital to the overall stimulus of the US economy, which enjoyed some of its finest post-war years in the 1950s.\textsuperscript{230} Moreover, the rise of AI-powered computers is likely to create an economy that is more focused on the virtual than on the real sector, since the returns of participating in a computer-driven financial sector would be far higher than in a human-driven real economy. This would have disastrous repercussions for the social fabric of Western societies, where the wealth gap would be exacerbated by the proliferation of “instant billionaires.” By using superior computers, the new billionaires would accumulate vast wealth by siphoning money away from the real sector, which accounts for the majority of employment in most Western economies.

The social consequences of a widening wealth gap in Western countries is fairly predictable, since history knows multiple precedents where social unrest followed years of growing economic inequality.\textsuperscript{231} In an age where AI dominates an economy that does not demand human labor, unemployment is likely to rise as capital will be diverted towards computer-driven enterprises. This is likely to lead to a widespread sense of disillusionment among citizens, the majority of whom will feel dissatisfaction with their


\textsuperscript{231} Theda Skocpol, \textit{States and Social Revolutions: A Comparative Analysis of France, Russia and China} (Cambridge: Cambridge University Press, 1979), 24.
present and have little hope for their future. Reducing society to a small group of high net-worth individuals enjoying the fruits of automation with the majority of citizens enduring declining living standards will make social unrest more likely. In addition, the usurpation of humans as the key decision-makers in a nation’s economic system is likely to pose major challenges to the social safety net. Heretofore, computers have been unable to generate emotional data, so few would understand the appeal of a social welfare system in which wealthier members of society contribute funds to a safety net designed to ensure no member of society lives in abject poverty. To a computer, this may seem illogical. Why, after all, should the seemingly more productive members of society be forced to divert some of their wealth towards their apparent unproductive fellow citizens? The equation of a citizen’s “value” to society with this economic power would undermine the very fabric of the post-war social order. In the aftermath of the left and right-wing totalitarianism arising in the 1930s in countries plagued by mass unemployment, Western societies developed wide-reaching welfare systems, which were designed to alleviate the living standards of the working class and deter them from joining anti-establishment movements.²³² In these societies, a citizen’s “value” now transcended his or her economic contribution, since it was accepted that the status of “citizen” bestowed the right to certain economic benefits, regardless of material income.

An economic transition driven by AI would complete the transition from an aristocratic social system to an oligarchical one. Current oligarchical systems are already identified as worse than the robber barons of American industry. Specifically, the transition would move from an economy with a high level of wealth inequality between the plurality of the working class and a group of affluent specialized businessmen to an economy with levels of wealth inequality not seen since the Great Depression. It would be dominated by a minute group of computer-controlling oligarchs dominating all sectors of the economy. Some analysts remain unperturbed by this prospect. They respond that if computers create more wealth for society, all citizens would be better off, since the government would have more wealth at its disposal to distribute to those displaced by machines. But such a thesis presupposes that computers will actually create greater wealth in the long term, which in itself is a debatable assumption. The spread of computers is likely to create an oligarchic economic system, where unproductive citizens are perceived as valueless. The market cap of FANGMAN (Facebook, Amazon, Netflix, Google, Microsoft, Apple and Nvidia) is estimated to be $5.2 Trillion USD, which is greater than the GDP of both the UK and France combined.

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Whereas, the entire employee base of FANGMAN can comfortably reside in upper
eastside New York.

Figure 4-1: Fangman worth more than France and UK combined, December 2019

The possible additional wealth generated by computers might instead be short-
lived, still limited to a select few humans who retain control of the algorithms and
govern machine behavior. Therefore, in the longer term, a computer-powered oligarchy
is unlikely to be much different from previous oligarchies, whether in the agricultural or
industrial ages. Traditionally, oligarchies have tended to be short-lived, as they
combined high levels of wealth inequality with low productivity and low levels of
innovation. Combined, these factors eventually led to economic stagnation, a brain

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236 Ibid.
drain, and ultimate defeat in cross-border national competition. There is nothing to indicate an oligarchy founded on the exclusive control of labor-replacing machines will not devolve into economic dysfunction and widespread poverty, as has been the case in the past.

4.2 Political implications

As technology for generating, storing, and utilizing data has increased exponentially, the political scene in Western democracies has undergone a dramatic shift from post-Cold War politics. The effect of machine learning in politics is fairly similar to its effect in economics: it gives a select few humans greater power to achieve their goals by performing specialized tasks to a level unseen in human history. In economics, that task has centered on trading strategies. In politics, targeted messaging has become the staple of every successful political campaign. Some of the more populist political strategists have lauded the power of technology, claiming it gives candidates a greater chance to identify voters and connect with their target audience. The goal of technology companies like Facebook, YouTube, and Twitter is user engagement, and this engagement focuses on making technology persuasive. “For more than 70 percent of the time you spend watching on Google’s massive video site, you’re lured in by one of the service’s AI-driven recommendations,” says Neal Mohan, Chief Product Officer at YouTube. “And if you’re watching on a mobile device, the average watching session
lasts more than 60 minutes, totaling more than 2 billion hours per month. Mohan sees YouTube’s "recommendations engines" as the reason for this. Tim Berners-Lee, one of the creators of the World Wide Web, warns about the phenomenon: “We demonstrated that the Web had failed instead of served humanity, as it was supposed to have done, and failed in many places... the increasing centralization of the Web, ended up producing—with no deliberate action of the people who designed the platform—a large-scale emergent phenomenon which is anti-human.”

The race for attention or engagement has led the giants of social media to employ the same techniques that are deployed by the alcohol and gambling industries. The touch-screen gesture known as “pull to refresh,” performs a similar action to that of a slot machine. The removal of "stopping cues," like refilling alcohol before the glass is empty, prevents drinkers from knowing how much they have drunk. Using these techniques, YouTube drives considerable traffic via its auto-play feature, which automatically begins a new video after the current video ends. Auto-play works by removing stopping cues—or to put it another way, by removing a mental trigger for the

user to decide which video to watch. Everyone is receptive to the persuasive effects of such techniques, but children and teenagers are more vulnerable to them than others. *Psychology Today* reports that getting a “like” or “invite” on Facebook has the same effect on the brain as that of dopamine and oxytocin, respectively. Social validation is a strategy used by technology companies to keep users engaged, while simultaneously creating mass narcissism within society.241

Meanwhile, the disproportionate evolution of targeted messaging has distorted political campaigning. Targeted messaging is now seen as the single most important factor in political campaigns, with many candidates focusing on honing their messaging skills to the detriment of everything else. As a result, more and more campaigns focus on fringe issues, which have few supporters but whose supporters are nearly guaranteed to turn out on voting day. The implications of social media on politics can be seen in Facebook’s estimate that more than 150 million Americans were reached by Russian propaganda in the 2016 election.242

Political campaigns have also become more concentrated, whereby they address one or two issues in detail and leave others untouched. A clear example of this is the 2016 Trump campaign, in which he proposed a wide range of policies for immigration,

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trade, and relations with China, while having virtually no specific proposals for other relevant issues. This has led to a proliferation of governments that are committed to tackling one or two problems thoroughly, with no concern for other pressing matters. In a world where factors are increasingly interconnected, this trend does not bode well for governments, where competence is expected in solving global issues. Besides encouraging campaigns to become increasingly narrow, machine learning has enabled some candidates to mobilize support in legally questionable ways. After every major election in the United States, controversies have emerged over computers enabling some to vote illegally, while suppressing some legitimate voters. But most importantly, the disproportionate power of machine learning is threatening to redefine the nature of political campaigning in Western democracies. In the aftermath of World War II, political parties sought to broaden their appeal to prevent a significant number of voters from falling into the hands of small, mobilized political factions with anti-democratic sentiments. Each Western nation had a select number of “catch all” parties, which ensured the continued function of legislative chambers by promoting a sense of compromise and keeping small factions from breaking parliaments into chambers of multiple warring factions. A political party’s chances of winning general elections depended on its ability to widen its appeal. That is hardly the case anymore. In the last three years turnout has replaced wide appeal as the new golden chalice of politics.
Today, successful campaigns use machine learning to identify a select few voters and then motivate them to turn out. Very few candidates worry about voicing the concerns of the majority. Instead, most use data patterns to identify the voters most likely to turn out and then mobilize them.243 In November 2016, between 5,000 and 10,000 protesters marched in a demonstration organized on Facebook by a Russian propaganda account.244 A few more political cycles in this direction, and it is not hard to imagine a regression of Western political systems to those of the 1930s, where Western democracies were threatened by a proliferation of small political parties with fanatical followers more interested in disrupting democratic governments than participating in them.

Technology companies have set up large psychology departments which assist in manipulating human behavior through the coding process. Moral outrage happens to be the greatest engager of all. “There is a whole contingent of actors who are actively trying to gin up outrage,” says Dr. Sarah Sobieraj. “This has become a mode of persuasion that is everywhere.”245 Stanford University researcher Marc Smith developed a program,

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NodeXL, which analyzes and visualizes social media chatter. Smith analyzed the 2017-2018 U.S. 115th Senate co-voting network. He found deep engagement and chatter in two distinct groups, shown below. Of note, is that chatter is seen to be happening among democrats and republicans but not between them.

![Political Chatter Diagram](image)

**Figure 4-2: Political Chatter Diagram**

This diagram is a result of Hullman’s study of Tweeter. An independent study shows that people almost always retweet other people who have political viewpoints similar to their own, demonstrating how little positive engagement takes place between opposing political viewpoints on Twitter. Polarization of society is a business strategy

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248 M. D. Conover, J. Ratkiewicz, M. Francisco, B. Goncalves, A. Flammini, F. Menczer in Intelligence Association for the Advancement of Artificial Intelligence, AAAI Conference on Weblogs and Social Media
for technology companies. A few months ago, YouTube recommended content with words such as “hate,” “debunked,” “obliterated,” and “destroyed” alongside certain videos. Although dependent on the search performed by the user, YouTube still showed bias towards sensational conspiratorial content. A teenager searching for diet videos was served anorexia content and searches for the moon landing recommended flat earth or moon landing conspiracy videos. Research done by Bellingcat.com shows that over fifty percent of white nationalists claim to have been “red-pilled” (come to accept a concept that is hard to trust)\textsuperscript{249} on YouTube.\textsuperscript{250} Add to this a Columbia University finding that 60\% of users share a link that they have not clicked on or read.\textsuperscript{251}

None of this offers much optimism for future political campaigns. Computers are currently the best performers among political campaigners. They spread the candidate’s message to the highest number of voters, they reach the highest number of donors, and they process the most data at the quickest pace. It is not hard to imagine a future where machines may suggest campaign strategies to candidates by offering the most lucrative target group of voters for the candidate to message, nor is it hard to imagine machines


offering specific policies by showing candidates which issues are the most pressing among their target base. Nine out of ten fake news websites from the month before the 2016 election were still in the top ten across Twitter almost two years later.\footnote{Matthew Hindman and Vlad Barash, “Disinformation, Fake News and Influence Campaigns on Twitter,” (John S. and James L. Knight Foundation, 2018).}

In politics, as in the case of economics, we are not far from surrendering our control over defining the ends of our activities. Many populist candidates are currently using data analysis to confirm their instincts, whether it be Trump using data to confirm his instinct that immigration is the most pressing concern among Republican voters or the Brexit campaign using data to confirm its suspicion that most “Leave” candidates would not be deterred by dire economic warnings of a post-Brexit stagnation. The danger that AI poses to Western political systems is that it threatens to create candidates who merely follow the direction of data-analyzing machines when deciding who to target and what to propose. The purposes of these candidates would be defined by inanimate machines, which could easily replace human voters as de-facto masters of the political system. The first obvious consequence would be an increase in the number of candidates who run for office with no plan for government whatsoever. And why should they have a plan when electoral victory would be guaranteed by following the directions of machines, rather than by having a firm grasp on key issues? Secondly, we
may see increasing numbers of candidates who merely pander to their supporters’ base instincts. American entomologist and biologist Edward Wilson states it best. He notes that the real problem with humanity is: “we have Palaeolithic emotions, medieval institutions, and god-like technology.” This leaves humanity ill-equipped for government, since most Western political systems can only function when all sides display a modicum of inclination to compromise with political opponents. However, in an age where turnout carries more political value than wide appeal, political systems are likely to be dominated by candidates who follow the most passionate of their supporters, who, in turn, are likely to sympathize with extremism and disregard any notion of compromise. The mismatch between the traditional Western political systems and AI-produced uncompromising candidates is likely to lead to government paralysis and even greater discontent, as countries will be governed by people whose political experience offers them no guidance on navigating the political system they are elected to lead. In 2013, Facebook developed TAO, a social graph that stores comprehensive information about every one of its two billion users. It’s best imagined as an avatar of each user residing in a supercomputer, ready to influence the user with recommended

content and advertising and, in so doing, achieve the company’s global goals. Through this system, Cambridge Analytica was able to determine the political personality of users based on as little as 150 “likes” a user might have clicked on Facebook.255 The white nationalist “stop Islamization of America” protest at the Da’wah Islamic Centre in Houston was organized from Russia by Russians using Facebook groups.256 At present, AI is already able to predict the political alignment of individuals by analyzing texts on Twitter.257

The danger AI presents to Western civilization is clear. The contemporary world order was established during the age of reason, when human knowledge supplanted religious doctrine as the foundation of human society. Since then, governments have gradually moved away from trying to construct societies governed by religious order to societies governed by human reason. Statesmen had a new role: instead of imposing a religious creed on mortal beings through law, they now attempted to translate human experience into legal systems. As a result, nations gradually moved towards democracy and governments increasingly saw their calling in leading their societies towards

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evolution. This evolution was to be achieved by implementing an elevated doctrine (such as the human need to be free) which would be achieved by progressive compromise between societies’ different factions, the existence of which was based on varying human experience. In these democratic systems, candidates tried to reflect the positive visions of their electorates, which the electorate would convey through polling and other methods of public discourse. The candidates would then attempt to implement these visions by suggesting government policy that compromised between elevated intention and mundane reality. This made evolution possible, allowing for the existence of multiple different interest groups within a single society without paralyzing the work of governments.

A political system where candidates are produced by AI threatens to erode the contemporary political order. AI threatens to make emotion the most valuable currency in the political system, since candidates would be encouraged to appeal to the most passionate voters likely to turn out and vote. During the 2016 election cycle nearly twenty percent of tweets aimed at strengthening political alignment among voters were issued by bots, with no human intervention.258 Candidates who owe their existence to passionate minorities tend to prioritize confrontation over compromise and radicalism.

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over moderation. Research has shown that Google search results can shift the voting preferences of undecided voters by 20% or more, with users having virtually no awareness of the manipulation at work in the background.259

In this context, a growing chasm is likely to emerge between politics and government. In other words, to succeed in a campaign, candidates are likely to need qualities that are at odds with the qualities they need to succeed in government. Most Western citizens today feel their governments show little ability to tackle pressing problems, but that feeling is likely to become more prevalent as the gap widens between candidates and their ability to relate to and meet the needs of the people. Currently, the most threatening problems to society are international, relating to the environment, nuclear war, and cultural tension, while AI threatens to put leaders in charge who will instinctively appeal to emotional minorities and pursue total victories rather than compromise-based solutions.

4.3 Theological and ethical implications

A theological understanding of humanity and its relationship to God and the world is being redefined by the development of AI. The creation myths that we surveyed clearly place the responsibility of bringing order from chaos on humanity (cf.

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Genesis 1:28). Unless humanity can find a way to fuse this same moral image they possess into AI, the world risks creating “masters” that will lead and direct the affairs of humanity from a purely utilitarian position. The intent, purpose, and goal programmed in AI will determine its behavior. An AI programmed for maximum financial profitability will strive to achieve such profitability at all costs, which could work against humanity, life, order, and human flourishing on our planet. With humanity being created in the image of God and being brought to life with the breath of God, one can see how the moral and ethical foundation of humanity ought to be found in God.

In discussing Karl Barth’s theology of creation, David Fergusson draws attention to the way creation is “infused with the divine spirit” and how “the natural world has a mysterious potency which shapes the religious and ethical life of self-conscious agents.”

This infusion of the divine into the natural carries implications for AI development and how it should ultimately be seen when viewed through a theological lens. Could it be said that AI will ultimately need to possess the divine Spirit in order to be truly considered a living entity?

Central to Barth’s discussion on creation is the idea of “covenant,” which speaks of God’s intention to work in relationship and partnership with humanity. Barth sees

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Jesus as the Archetype of humanity, and it is in Jesus that we see how humanity is to interact with creation, fellow human beings, and with God. When considering the creation account and God’s original dealings with humanity, it seems incongruent to think that AI can replace humanity. Relationship was central to the first created beings, relationship with God and interpersonal relationship with each other. In Genesis we see God’s concern with Adam’s loneliness and the way God addresses this need through the creation of Eve. Central to the creation account is the relational damage caused by humanity’s sinfulness. It is then only through the Archetype, Jesus, that this relationship is restored. The resultant responsibility to come from humanity’s reconciliation with God is that humanity is now given the work of reconciliation (2 Corinthians 5:18), once again emphasizing the relational priority of human existence.

In generating a particular conceptual space between God and creatures, relationship becomes the necessary condition for the form of divine address to human beings. Instead of an expression of sheer divine power, the creation *ex nihilo* should be understood in the context of the ethical determination of human beings by God. Our creaturely status places us at once in a relationship that is characterized in personal terms such as responsibility, agency, freedom and love. The language of covenant is thus closely interlinked with the creation *ex nihilo*. Hence a relationality is intended and

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established by virtue of God’s creating from nothing. This aligns with Dennis J. Snower’s discussion on “decoupling.” Snower notes how development and production is growing at the expense of social and environmental capital, a phenomenon he refers to as a “dangerous decoupling.” This “decoupling” will have an economic and social impact; however, it will also have a theological and ethical impact as the role and nature of humanity will change with the onset of a more AI-driven society. Most notably it will “call into question our understanding of what, fundamentally, it means to be human.”

Consider the recent institution of a robot priest in a 400-year-old Buddhist temple in Kyoto, Japan. The robot can bless people, give advice, and even perform funerals. As efficient as this may seem, it cannot take the place of the biblical model of priesthood, whereby the priest stands as mediator between God and humanity. Moral, ethical, and theological implications need to be considered in situations such as this. As noted, robots such as this do not carry the breath of God and will therefore be functional machines void of the divine Spirit, which brings morality, ethics and relationships to

humanity. It stands to reason that a living God is best served by a living priesthood. AI can simulate life, but it cannot truly live without being infused with the divine Spirit.

As AI develops and functions within a society transitioning from human to machine, theology will need to play an important role in determining what makes us truly human. There is a need for more intentional theological work aimed at developing a robust anthropology, which will help create a deeper understanding regarding humanity and what sets us apart from what humanity can create.

Patients are asking plastic surgeons to alter their faces to look like their filtered faces on social photo applications. These requests are so common that doctors have coined the term “Snapchat dysmorphia” to describe the condition. Facebook’s dominance in political campaigns has already cost lives in both Sri Lanka and Myanmar. Studies have shown that children being “cyber bullied” are three times more likely to consider suicide compared to children who are bullied in the traditional way. Technology is clearly having an impact on the social cohesion of society, and

there is a need to acknowledge this impact and address it, especially seeing as the development of AI will intensify this onslaught.

The “presentation” stakes on photo applications like Instagram not only conceal the reality, but also result in dissociation, detachment, and a sense of regret. Tavi Gevinsen, an actress and influencer on social media platforms recently wrote about her Instagram life: “When I review posts . . . I almost envy my own life as though it were someone else’s.”270 The founder of a Christian veterans’ group recently discovered how Google has banned the word “Christian”271 on its YouTube platform and blocked Christian and conservative organizations from advertising.272 This is now being done in addition to demonetizing conservative religious channels.273 With the help of AI technology, thousands of organizations’ voices can easily be silenced with the click of a mouse, serving whatever agenda is most prominent within that given organization without. For Google it’s simply a matter of banning advertising from groups and individuals that are not aligned with the company’s values. Google is still, however, largely considered a left leaning organization, and so it can be expected that this will

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drive their agenda and values.\textsuperscript{274} When considering Google’s size and impact around the world, it is easy to see how technology companies such as this can and will push culture in a certain direction.

Two key issues discussed here are the scale of deployment of technology and its ability to impact billions of people within seconds. Also, with the use of AI, the real-time monitoring and speed of execution is increasing exponentially. An illegal road crossing in China can now be detected using AI, which will not only report the offense but will also recognize the person. AI will register an infraction on the individual’s name and detract from that person’s Social Credit Score (which gives access to China’s utilities and benefits programs).\textsuperscript{275} What few understand is that China’s Belt and Road initiative (BRI), a long-term plan to optimize the previous silk road trading route, has a digital version. China is deploying this same face recognition technology in 58 pilot countries that have signed up to be part of the BRI. It’s culturally acceptable to be monitored by authorities in China:

“What does it mean for 58 pilot countries to have in their hands a technology capable of mining and refining and learning about all of their citizens, and reporting any infractions on up to authorities?” In places like the Philippines, where free speech right now is questionable, this kind of technology, which does not make sense to us as Americans, may make slightly more sense to


people in China, becomes a dangerous weapon in the hands of an authoritative, an authoritarian regime elsewhere in the world."

Though technology has brought many blessings, it also brings many unintended consequences. By allowing AI and algorithms to control a great deal of what we see and do online, we may inadvertently be creating a “father of a digital Frankenstein,” steering billions of people’s attitudes, beliefs, and behaviors. How can the church become credible in taking leadership to ensure such technologies lead to a flourishing of life and civilization in the age to come?

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5. AI and the Church

Tertullian aptly criticized the relationship between philosophy and religion:

“What has Athens to do with Jerusalem?”277 Brian Patrick Green paraphrases, “What has technology to do with Theology” or more anachronistically, “What has Silicon Valley to do with Jerusalem (or Rome)?”278 The breadth and depth of technological development, specifically the advancement of AI, calls for the consideration of religious tradition and thought. Unfortunately, the church has largely remained silent. Is it possible that the church is unknowingly and unintentionally neglecting its responsibility to the new sins that are emerging within the church and its broader context? This would not be the first time the church has neglected its responsibility to society. Over the past few decades the world has been wrestling with the AIDS epidemic; for the most part, the church entered this conversation too late. Given nearly 50% of all health care in Africa is provided by the Catholic Church in one form or another, the church had a real chance to bring the gospel into the AIDS discussion and impact communities in a Christian manner through medical care and participation, had it acted sooner.

278 Brian Patrick Green, “The Catholic Church and Technological Progress: Past, Present, and Future,” Religions 8, no. 6 (June 2017): 106.
5.1 AI and ethics

Ethics and AI has become a prominent focus amongst secular institutions and technology companies. Google formed an ethics board and formulated a charter in this regard, though it did so reacting to employee complaints about the company’s work with a Pentagon AI project code named “Project Maven.” Google’s London subsidiary has done the same thing. Microsoft has drafted its own AI principles, forming an AI ethics committee as of 2018. Partnering with the National Science Foundation, Amazon has sponsored research into “fairness in AI.” Facebook established an AI research center in Germany. IBM has also spoken about the ethical impact of AI and is addressing issues such as removing racial bias from facial recognition systems.

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However, as late as 2016, IBM’s technology was still in use in the Philippines, where it is thought to have played a role in more than 200 extrajudicial killings.285

The problem with the AI ethics boards, committees, and charters being established by big technology companies is that the companies do not reveal who serves on these boards and whose interests are being addressed by their efforts. Such lack of transparency, intentional or not, is having major ramifications on the deployment of these entities. As discussed in chapter 4, AI and technology continues to negatively impact our planet and communities. New York University’s AI Now Institute confirms that there is very little, if any, evidence that these ethics boards have made a difference in the ways AI is built and deployed.286 A North Carolina State University study showed codes of conduct made no impact on developers or how they code programs.287 This is evident in companies such as Google, who, after forming an ethics board, continued to deliver AI technology to the Chinese government. The project in question was named “Project Dragonfly,” a project many believe infringes on human rights. Google denies continued involvement, but their employees have taken a closer look and think

otherwise. Even though some algorithms are considered “ethical,” that also does not necessarily rule out their use for highly unethical causes. The ethics boards established by these technology giants remain powerless, with little to no authority to effect change or stop projects. Their function is limited to that of an advisory board and little more.

Google employee Zach Vorhies presented over 950 pages of evidence to department of justice showing company’s bias toward left wing liberal political parties. To summarize, these companies have articulated that AI should treat all people fairly, empower everyone, perform reliably and safely, be understandable, be secure, respect privacy, and have algorithmic accountability. AI should align with existing human values, be explainable, be fair, and respect user data rights. It should be used for socially beneficial purposes and always remain under meaningful human control. Whether they implement these values remains to be seen.

The noblest of these companies was OpenAI (openai.com), a nonprofit research lab that started off with the following goal: “the lab wants to ensure that the technology is developed safely, and its benefits distributed evenly to the world.” Within a few

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years, not only did the lab turn for-profit and take a billion dollars from Microsoft, but they also capped their return on investment to such investors to 100 times their investment amounts.290

*Nature* magazine sees an awareness of ethics in AI as expanding globally, though perhaps more so in the Northern Hemisphere.291 Eleven principles have emerged as common and converging as a result of this exercise:

![Table 3 Ethical Principles Identified in Existing AI Guidelines](https://www.nature.com/articles/s42256-019-0088-2/tables/3)

**Figure 5-1: Ethical Principles Identified in Existing AI Guidelines**292

The point that is missing in all this is the inability of a machine or algorithm to embody or contain ethical principles. This is a discussion and conversation to be had within a human context. Even there, it is likely to be no different from discussions where people fail to agree on terms and words, much less on something as important as ethics.

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Within our current polarized society, liberals struggle to agree with conservatives in matters such as redistribution. Words like gig economy, collaborative economy, and a sharing economy are interpreted as “insecure temporary employment,” “cheap outsourced labor,” and “largely unregulated online rentals.” The California legislature has rewritten the law defining the concept of an employee, and, in so doing, has limited employers from circumventing the payment of benefits to their employees. Employers have, up until now, avoided this extra burden by seeing their employees as gig economy workers.\(^{293}\) The motive behind most businesses is to enhance shareholder value, and in the recent past we have even seen some companies assist totalitarian regimes in order to boost these profits.\(^{294}\) Responsibility and accountability for ethics will ultimately lie with the person in charge of programming the AI.

It is encouraging to see the Southern Baptist Convention joining this discussion through their Ethics and Religious Liberty Commission with “Artificial Intelligence: An Evangelical Statement of Principles.”\(^ {295}\) This document addresses topics including data, privacy, war, bias, sex, and medicine. Its treatment reckons with accountability and the


\(^{294}\) Madhumita Murgia and Christian Shepherd, “Western AI Researchers Partnered with Chinese Surveillance Firms,” April 19, 2019, [https://www.ft.com/content/41be9878-61d9-11e9-b285-3acd5d43599e](https://www.ft.com/content/41be9878-61d9-11e9-b285-3acd5d43599e).

image of God. This document has taken shape despite the commission finding its origin in a more conservative protestant group and sticking to a narrow slice of evangelical dogma. It would be helpful if this discussion was broadened to include other Christian groups such as the Dalit Christians of India or the Masai Christians of Tanzania. As things stand, the commission struggles to part with American affirmations of just war and traditional marriage. A lack of participation from industry experts in the field of AI is also evident. For example, they say the following:

“We deny that any part of creation, including any form of technology, should ever be used to usurp or subvert the dominion and stewardship which has been entrusted solely to humanity by God; nor should technology be assigned a level of human identity, worth, dignity, or moral agency.”

The statement’s first claim is commendable, but its latter claim about moral agency is unnecessary, given it assumes strong AI, which is both theoretical and perhaps impossible.

“We deny that the use of AI is morally neutral. It is not worthy of man’s hope, worship, or love. Since the Lord Jesus alone can atone for sin and reconcile humanity to its Creator. Technology such as AI cannot fulfill humanity’s ultimate needs. We further deny the goodness and benefit of any application of AI that devalues or degrades the dignity and worth of another human being.”

Here again the initial judgment is sound but doesn’t go far enough because it assumes strong AI.

“We affirm that, as a tool created by humans, AI will be inherently subject to bias and that these biases must be accounted for, minimized, or removed through
continual human oversight and discretion. AI should be designed and used in such ways that treat all human beings as having equal worth and dignity. AI should be utilized as a tool to identify and eliminate bias inherent in human decision-making.”

Once again, the statement’s first two claims are solid. However, the third is outside of the realm of current research and is fraught with moral danger. It would be helpful to further clarify what oversight would look like. What safeguards will be set in place to ensure the absence of bias in the process? Who determines what is either acceptable or unacceptable AI programming?

The Church must “above all protect mankind from self-destruction.” Brian Green highlights these words spoken by Pope Francis regarding technology. Green draws three conclusions about what that protection might entail: mitigating and adapting to global catastrophic and existential risk, limiting the negative effects of transhumanism, and encouraging space exploration and settlement.²⁹⁶ Generally speaking, more careful attention needs to be given to these statements by adding further definitions and qualifiers. Some big questions, many of which currently do not have satisfactory answers, are not addressed as part of these principles. For example: How is human existence defined? What does it mean to be human? What is consciousness? How does this all impact the way we see AI, life, and death, or should we simply call AI “non-

²⁹⁶ Green, Palmer, and Corcoran, In Search of the Soul: Four Views of the Mind-Body Problem, 11.
life?” In addition to mathematical skills, AI has shown surprising artistic, social, and linguistic skills. The Baptist commission fails by prescribing inaccurate caution guided by unethical “informed consent” as a prerequisite. What about a curious mind and continued improvement? Is it possible that research without “informed consent” could save millions of lives? This is further affirmed in the document by stating “God alone has power to create lives.” Creating a new bacterium is neither impossible nor immoral. The roots of scientific enquiry are firmly placed in the Protestant Reformation and the printing press, so should this be discouraged?

George Barna and David Kinnaman’s research on why young people leave the church highlights anti-science as one of the reasons for such exile.297

“Dialogue, creative problem solving, living with questions and with ambiguity, group brainstorming, the opportunity to contribute — these are highly valued by the next generation. To the extent that we in the Christian community insist that young adults should just accept our “right” answers, we perpetuate a needless schism between science and faith.”298

They go on to note that most students are likely to lose their faith even before college as they experience a disconnect from church.299 They call upon people of faith to positively and prophetically address issues of faith and science and avoid hostility and

298 Ibid, 135.
299 Ibid, 140.
ignorance in this regard. Connecting young, enquiring minds with mature Christians in these fields of study is a possible solution to this problem. In this way they are aided in how they think and not just in what to think.

On the one hand, big technology companies have made a lot of noise about the ethics of AI but only to avoid scrutiny and regulation. On the other hand, churches have experienced exile due to their anti-science stance, when in fact churches exist as culture-makers in the world. Cardinal Francis George of Chicago says it best: “I expect to die in bed, my successor will die in prison, and his successor will die a martyr in the public square. His successor will pick up the shards of a ruined society and slowly help rebuild civilization, as the church has done so often in human history.” Is it possible for a church which has taken a sort of mythical body, detached from science and reality, to rebuild civilization?

5.2 Practical suggestions

Steps need to be taken if the church is to engage society, whether in a preventative or reconstructive role. In this section, I will make some practical suggestions in this regard.

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300 Ibid, 143.
301 Ibid, 144-145.
5.2.1 Revisiting Frankenstein

The diagram below represents a 16-step graphical representation of Victor’s ambitions, and at first appears to be unrelated to technology. Ambitions drive people to do amazing things, and in some cases, technologists have become successful. Mary Shelley at no point discourages the invention of Frankenstein. She simply highlights the detrimental effects of unbridled ambition for fame, glory, and recognition while giving no consideration to the impact on the created technology, fellow humans, or on one’s self. We have already examined the implications on Victor’s friends and his creation, but how did this creation impact Victor himself? How is he impacted by success?

![Victor's ambition leads to a world of chaos](image)

Figure 5-2: Introduction of Technology and Ethics with Resultant Chaos

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303 Shelley, *Frankenstein*.
We have already examined the implications on Victor’s friends and his creation, but how did this creation impact Victor himself? How is he impacted by success? Victor regrets what he has done and runs from his creation for two years, desperately trying to avoid further harm. He does this until his death.

A large number of new technological inventions have come into existence since Shelley’s novel. Kamran Loghman, the inventor of pepper spray, regrets his success. He initially wrote down guidelines for its use but recent misuse of his product by police and gangsters has made him regret his invention.304 Bob Propst’s invention of the office cubicle was intended to give employees more privacy and freedom while working. He is another inventor who ended up denouncing his creation, noting how the ideology of the modern corporation’s cubicle-izing of people is a form of monolithic insanity.305 Tim Berners Lee developed the internet to be an open forum for the world but regrets the way his invention is used by companies such as Google and Facebook, which lock people into the walls of their domains.306 Mikhail Kalashnikov is known as the inventor of the AK47 assault rifle, which became the choice weapon for gangsters, terrorists, and

dictators all over the world. Just before his death, Kalashnikov wrote a letter to the head of the Russian Orthodox Church asking whether he should be blamed for the deaths of millions of people who have died from his invention over the last few decades. He questioned God for allowing humanity to harbor such cruel urges and capacity for greed and aggression.\textsuperscript{307} J. Robert Oppenheimer and his team at the Los Alamos Laboratory during World War II believed that they were creating a safe world for themselves and the citizens of their country. In his last years, Oppenheimer said that the war had made humankind numb and that they had made a grave mistake in inventing the atomic bomb, which causes such large scale destruction.\textsuperscript{308} The man whose name is synonymous with the word “peace,” Alfred Noble, is credited with inventing dynamite, which was to be used to efficiently blast through rock. After seeing how people were misusing his invention for hurting and murdering people, he wrote in his will that most of his assets should go to creating a fund that would reward people who brought positive change in our world.\textsuperscript{309} All these figures have one thing in common with Victor Frankenstein. They all regret their technological successes. What are the implications of


a successful invention? This is a question that needs to be asked more often and given more thought before an invention is undertaken. This consideration has been referred to as a “pre-mortem.” This is, however, not the normal process taken by all people. In many cases inventors announce their technologies pre-maturely. An example of this would be Elon Musk tweeting about the release of a new software system for the Tesla in 2015: “Some exciting news this week: Tesla Version 7 software with Autopilot goes to wide release on Thursday!” Premature announcements such as this can result in monstrous consequences and even the loss of life. In 2019 the BBC reported on a fatality involving this new autopilot system. Illegal genetic experimentation by a Chinese doctor serves as another example of unbridled human ambition. In this instance, China called for the immediate halt to Dr. He Jiankui’s work following his announcement he had helped make the world’s first gene-edited babies using a tool referred to as CRISPR.

Unethical and misleading behavior from the leaders of Theranos, a company which purported to simplify blood analysis, resulted in the loss of human life and the

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Ambition and the intent of the human heart are key to what we invent and why we do it. Ray Kurzweil, a prominent inventor and "futurist," has long predicted that mind and machine will one day merge. He believes he will one day be able to speak to his dead father with the help of a computer: "I will be able to talk to this re-creation ... Ultimately, it will be so realistic it will be like talking to my father." It is appropriate to compare the ambitions of Ray Kurzweil to those of Victor Frankenstein: “These are my enticements, and they are sufficient to conquer all fear of danger or death, and to induce me to commence this laborious voyage with the joy a child feels when he embarks in a little boat.” However, in his final words Victor says, “Seek happiness in tranquility, and avoid ambition, even if it be only the apparently innocent one of distinguishing yourself in science and discoveries. Yet why do I say this? I have myself been blasted in these hopes, yet another may succeed”.

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315 Shelley, Frankenstein, 43.

316 Ibid, 182.
It is time for the church to make its voice heard. Pope Francis has noted that “a technology severed from ethics will not easily be able to limit its own power”. What is needed more than improved technologies is a morally improved humanity. Kate Ott in her book, Christian Ethics for a Digital Society, uses sound methods to introduce moral and theological questions raised by an aspect of digital technology. She addresses five components, namely, algorithms, the networked self, the permanence of digital information, e-waste and environmental impacts, and ethical hacking, all of which compromise a Christian social ethic. She discusses the role of forgiveness in a world where forgetting has become luxury. She encourages engagement of the heart and mind as a solution to this issue. Attempts by Ott are admirable but fall short of a proper engagement with digital society. In Christianity there are many noble values, however, the supreme value is that of love. Yampolskiy and Bostrom have outlined the risks and dangers if safety engineering is not programmed in the AI in the research labs. These serve as important safety reminders but still don’t address safeguards

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318 Green, Palmer, and Corcoran, In Search of the Soul: Four Views of the Mind-Body Problem, 10.
320 Ibid, 10.
321 Ibid, 74.
322 Ibid, 91.
related to issues of the heart and human ambition. To speak of “love” as a guiding principle in safeguarding technology is too broad and ambiguous a term to apply when assessing technological progress. Technological development is best assessed through the value of compassion. One of the names of God is “the father of compassion” (2 Corinthians 1:3). Jesus embodies the very essence of this compassion and relational care. In Him, Christians are challenged to forsake their own desires and to act compassionately towards others, particularly those in need. Is it possible for the church to promote the idea of Compassionate Technological Administration (CTA), which would be comprised of religious ethicists partnering with secular, industry, public and government entities to review and endorse technologies? Within an entity such as this, research can be assessed before being released. The United States Food and Drug Administration (FDA) operates in this way, protecting public health by ensuring the safety, efficacy, and the security of human and veterinary drugs, biological products, and medical devices, and by ensuring the safety of our nation’s food supply, cosmetics, and products that emit radiation. In a pandemic like COVID-19, the FDA has been able to maintain its values and prioritize safety regardless of the pressure it experiences.


from contemporary power structures. The formulation of an AI ethics entity such as the CTA would operate in much the same way as the FDA but will operate with the mandate to review and approve technologies through the lens of compassion.

5.2.2 Rediscover the scientific roots of the reformation

Publications of scientific theories and papers are insightful and helpful in establishing facts about the flourishing of science. A number of particularly significant discoveries were published from the fourth century BCE until the Reformation and advent of the printing press. In 323 BCE, Euclid wrote thirteen books on geometry called the *Elements*. In the second century BCE, Archimedes of Syracuse accurately approximated pi. In 280 BCE, Aristarchus of Samos used a heliocentric and heliostatic model. In 150 BCE, Seleucus of Seleucia discovered tides are caused by the moon. In 50 CE, Pliny the Elder wrote his *Natural History*. Theophrastus discovered a love potion in the fourth century, Mandragora, containing atropine, which could treat wounds, gout, and sleeplessness. In 150 CE, Ptolemy developed a geocentric model of the solar system. In the Greco-Roman world, formal education was limited to the sons of wealthy people. About the same time as Ptolemy, Justin Martyr established schools in Ephesus.

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and Rome, that included the sons and daughters of all the people. Other schools quickly spread through the region. In the 200s, Galen made contributions to the field of medicine. Then, in the 900s, Al-Kindi refuted the theory of the transmutation of metals. Jabir Ibr Hayyan also developed several acids during that time. The 10th century saw three discoveries: Muhammad ibn Zakariya al-Razi refuted the Aristotelian classical elements and Galenic humorism. Measles, smallpox, kerosene and distilled petroleum were discovered. Ibn Sahl described optics in 984 CE (now known as Snell’s law of refraction). The Book of Optics was published by Ibn al-Haytham in 1021. The Canon of Medicine was written by Avicenna during the same period. In 1054, astronomers observed a Supernova (now known as SN 1054, or the Crab Nebula). The first theory of geomorphology was discovered by Shen Kuo along with the concept of true north and magnetic declination. The twelfth century saw four discoveries, namely the variation of gravitation by Al-Khazini, reaction by Ibn Bajjah, force and acceleration by Hibat Allah Abu’l-Barakat al-Baghdadi, and kinetic energy by Averroes. A mere eight discoveries were made in the thirteenth and fourteenth centuries: the empirical scientific method by Robert Grosseteste, pulmonary circulation by Ibn al-Nafis, an explanation of the rainbow by Theodoric of Freiberg, use of the camera to view solar eclipses by William of Saint-Cloud, Occam’s Razor in 1327, the mean speed theorem, the theory of impetus by

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329 Alvin J. Schmidt, How Christianity Changed the World (Grand Rapids: Zondervan, 2004), 171.
Jean Buridan, and the discovery of the curvature of light through atmospheric refractions by Nicole Oresme.

These twenty-eight major scientific discoveries made in the fourteen centuries prior to the Christian reformation of the 16th century can be captured in under 500 words in the paragraph above. After the Christian reformation, hundreds of scientific discoveries were made, too many to list here. Of these discoveries, people like Copernicus, Vesalius, Servetus, Tycho Brahe, William Gilbert, Johanne Kepler, Galileo, William Harvey, Torricelli, Robert Boyle, Isaac Newton, Kant, Messier, Pascal, Volta, Dalton, Ohm, Faraday, and Joule all made scientific discoveries that still contribute towards human flourishing today. The Reformation can be seen as a catalyst to science and scientific discoveries.\(^\text{330}\) Johannes Kepler, the namesake of one of NASA’s telescopes, said the following: “God, like a master builder, has laid the foundation of the world according to law and order. God wanted us to recognize those laws by creating us after His image so we could share in His own thought.”\(^\text{331}\)

Gregor Mendel, an Austrian Catholic monk born in 1822, was the first to discover the basic principles of heredity through experiments in his garden. Mendel’s


observations became the foundation of modern genetics and the study of heredity, and he is widely considered a pioneer in the field of genetics. Christopher Hitchens calls Francis Collins one of the greatest living Americans and one of the most devout believers he has ever met. Collins led the human genome project and is serving as the director of the National Institutes of Health under both Presidents Barack Obama and Donald J. Trump.

Jaroslav Pelikan writes:

“One may perhaps begin to comprehend how completely Christ the Monk conquered the scholarly world of the Middle Ages by checking, in the standard modern editions, how many works of antiquity even exist for us today only because they were copied by monks in some medieval scriptorium… [works of] not only Christian saints but of classical and pagan authors.”

In his book, *How the Irish Saved Civilization*, Thomas Cahill shows how monks and Christian communities copied every ancient text they could get their hands on. For many centuries, monasteries were the only institutions in Europe for the acquisition, preservation, and transmission of knowledge.

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335 Jaroslav Pelikan, *Jesus through the Centuries: His Place in the History of Culture* (New Haven; London: Yale University Press, 1985), 120.
Cyril invented the Cyrillic script to give a written language to the Slavs. Universities came out of Christian monasteries. The motto of Oxford University established in the thirteenth century is Psalm 27:1 “The Lord is my light.” Universities spread across Europe to France, Italy, Austria, and Germany. In explaining the conversion of my father, David Kasbe, from a Dalit outcaste of India to the Christian religion, John Ortberg invokes the amendment Jesus made to the greatest commandment, the Shema: “Love the Lord your God with all your heart and with all your soul and with all your mind.” Jesus added the word “mind.” Ortberg goes on to explain, “To love God with your mind begins with being curious about God. We may go weeks, months, or even years without ever wondering, “Is there Somebody who made this world? What’s he like?” For followers of Jesus, however, loving God with “all your mind” meant even more. They believed Jesus taught that God created everything, that God thought everything up. Therefore, anytime we learn something true, anytime we learn about how creation works, or even about math or logic, we are actually thinking God’s thoughts after him. We are getting to know God, and we do that because we love

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338 John Ortberg, Who Is This Child? From Common Babe to King of Kings (Grand Rapids, MI: Zondervan, 2012), 59-73.
him. Learning can become an act of worship. Jesus’ followers said that learning about anything helps us to know and love God better. They loved truth.”

In America, the first law to require mass universal education was declared in Massachusetts in 1647. It is therefore no surprise that America leads the world in innovation across the board in science, math, technology, arts and economics, and other fields of study. Within six years of arriving in America, the pilgrims established a reputable university with John 17:3 as its motto, establishing Christ as the only foundation of all sound knowledge and learning. This university is Harvard University. All Ivy league universities (excluding Cornell) and about 92% of another 138 colleges and universities in America were built on biblical principles of education for all. In my home country, most schools and colleges even today have Christian names because they came out of the missionary movement “shining the light of education” in dark parts of the world. My country’s entire genealogy is littered with illiteracy due to the enslavement of the Hindu caste system. After my father’s conversion to Christianity, he learned to read and write using the Bible from missionaries in India. Ortberg writes of that legacy, which extends to me,

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339 Ibid.
“Timothy graduated with an engineering degree, an MBA from Duke University, and an advanced degree from Moore College Sydney, and he currently serves as distinguished visiting scholar at Stanford University. He explained that vast amounts of higher education in India have their roots in the Jesus movement. The Stanford family who began that university where Timothy is now a scholar also supported in its early days the church in Menlo Park that I now serve. The ripples do not stop.”

Given this history, how can the church possibly be anti-science? It is time for the church to call on millions of believers who are scientists, engineers, economists, and lawyers and start the dialog of how to make science mainstream in the church. The church must develop programs to make it more inviting to science forums, experiments, and discovery, from children all the way to retirees.

5.2.3 Move the discussion from the front of the Bible to the middle of the Bible

We have reviewed the creation account and other myths to survey fiction and the creation story. There are sincere people who espouse young earth creationism, old earth creationism, gap creationism, day-age creationism, progressive creationism, scientific creationism, neo-creationism, intelligent design, geo-creationism, the Omphalos hypothesis, and theistic evolution. I am not here to judge any of these views. Recent work by S. Joshua Swamidass, a physician, scientist, and assistant professor of Laboratory and Genomic Medicine at Washington University in Saint Louis is helpful.

342 Ortberg, *Who Is This Child? From Common Babe to King of Kings*, 59-73.
He leads a computational biology group that studies information at the intersection of biology, chemistry, and medicine. He goes a long way towards starting the dialog around differentiating genealogy versus genetics. His insights about those wandering outside the garden of Eden while the creation was being formed harmonizes creation with evolutionary theories. Science can’t disprove Eden, and the Bible is silent on evolution.

Focusing on disagreement is not helpful. As more computational power becomes available, we are going to discover more about our planet and universes. Why stay at the front of the Bible in the creation account when the main theme of the Bible is about Jesus, the only Son of God, the resurrected one? Focusing on Jesus and the cross is the only way to reconcile with the world and science. A sense of the irrelevance of religion and faith is nothing new. Mathew Arnold penned these words on his honeymoon in a poem called “Dover Beach,” in 1849:

The sea is calm to-night,  
The tide is full, the moon lies fair  
Upon the straits;—on the French coast, the light  
Gleams, and is gone; the cliffs of England stand,  
Glimmering and vast, out in the tranquil bay.  
Come to the window, sweet is the night-air!  
Only, from the long line of spray

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343 [http://swami.wustl.edu/](http://swami.wustl.edu/)
Where the ebb meets the moon-blanch’d sand,
Listen! You hear the grating roar
Of pebbles which the waves suck back, and fling,
At their return, up the high strand,
Begin, and cease, and then again begin,
With tremulous cadence slow, and bring
The eternal note of sadness in.

Sophocles long ago
Heard it on the Ægæan, and it brought
Into his mind the turbid ebb and flow
Of human misery; we
Find also in the sound a thought,
Hearing it by this distant northern sea.

The sea of faith
Was once, too, at the full, and round earth’s shore
Lay like the folds of a bright girdle furl’d;
But now I only hear
Its melancholy, long, withdrawing roar,
Retreating to the breath
Of the night-wind, down the vast edges drear
And naked shingles of the world.

Ah, love, let us be true
To one another! For the world, which seems
To lie before us like a land of dreams,
So various, so beautiful, so new,
Hath really neither joy, nor love, nor light,
Nor certitude, nor peace, nor help for pain;
And we are here as on a darkling plain
Swept with confused alarms of struggle and flight,
Where ignorant armies clash by night.
Arnold evokes Sophocles, a fifth century BCE Greek playwright, who stood on the shores of the Aegean Sea decrying “tragedies of fate and the will of gods,” whom Arnold brings to an industrial nineteenth century. He hears in this sound the retreat of religion and faith. Honan tells us

"The poem’s discourse shifts literally and symbolically from the present, to Sophocles on the Aegean, from Medieval Europe back to the present—and the auditory and visual images are dramatic and mimetic and didactic. Exploring the dark terror that lies beneath his happiness in love, the speaker resolves to love—and exigencies of history and the nexus between lovers are the poem’s real issues. That lovers may be ‘true / To one another’ is a precarious notion: love in the modern city momentarily gives peace, but nothing else in a post-medieval society reflects or confirms the faithfulness of lovers. Devoid of love and light the world is a maze of confusion left by ‘retreating’ faith.”

Christianity in peril is not a new concept. It seems as though the church has faced challenges in the areas of church attendance, affiliation, and baptisms in every generation. Christianity must take this opportunity to be what it was called to be: to represent God’s kingdom and his future in our lifetime. In his 1983 lectures at Moore College in Sydney, Bill Dumbrell approached both testaments with a wide angle lens to form the core of the conclusion to biblical history in the perspective of John’s apocalypse

346 Ibid, 239.
(Revelation 21-22). He organizes it around five themes: the new Jerusalem, new temple, new covenant, new Israel, and new creation. The order of these themes is logical in Dumbrell’s thinking: each is an aspect of “the Bible’s wider concept of government, the Kingdom of God … the new Jerusalem is the symbol of government and those governed; the new temple is the seat of government; the new covenant is the instrument of government, the new Israel reveals those governed and their role: the new creation is the final comprehensive presentation of both the governed and the Governor.”

Dumbrell finally opts for the new creation as the most comprehensive idea and summary of the other four themes. The entire scheme of the Bible is structured around the movement “from creation to new creation by means of divine redemptive interventions,” climaxing in Christ’s death, resurrection, and second coming which will conclude all things. Modelling God’s future in the current situation is the purpose of the church. The new Israel is then the people of God, one worshiping community, not necessarily an ethnic one. It is a community engaged, visible, and contributing to all facets of life in a tangible way, giving hope where it lacks, giving courage to replace fear, giving radical inclusion to replace exclusion, bringing inside the fold those that are on

350 Ibid.
351 Ibid, 166, 196.
352 Ibid, 84-84, 87, 143-144, 150, 155.
the edges of the network. Christ is the one, joining, common force made known to find true life.

5.2.4 Promoting a positive and mindful approach to AI

During the last century we saw the start of discussion relating to the theology of technology. The writings of authors such as Nicholas Berdyaev, Jacques Ellul, Lynn White, Paul Tillich, Carl Mitcham and Jim Grote serve as examples in this regard.353 More recent works by such as Albert Borgmann, Noreen Herzfeld, Brad Kallenberg, David F. Noble, and Brent Waters are now beginning to address the silence of the church in addressing technology issues and how they reframe Christian life.354 Humans are not called by God to be either co-creators or exploiters, but have been elected by God to assert a limited dominion over a finite and temporal creation in the name of the One whose image and likeness they bear.355 The derivative ethic (from limited dominion)


thereby provides an intermediate position between the extremes of a naïve romantic idealism on the one hand, and a reductionistic expediency on the other. In this respect, limited dominion elaborates the natural ethic examined in the previous chapter by seeking to identify a teleological relation between the providential unfolding of created order and creation’s eschatological destiny as revealed in the death, resurrection and exaltation of Jesus Christ.356

Albert Borgmann presents the notion of “device paradigm,” the concept of the artificial replacement of the real or original. The device paradigm is a social mechanism that conceals deep social structures even while it reveals a surface appearance. It prescribes a technological way of life in which a “traditional contextual” substance such as cream becomes an “opaque” commodity such as Cool Whip (artificial cream) through a “concealed and intricate machinery of techniques and therapies.357 Apple Computer on the other hand employs a whole team of people that work towards the obsolescence of their devices so people will be forced to upgrade their devices,358 devices built in factories in China where stressed workers jump out of the windows to commit suicide.359

356 Waters, From Human to Posthuman: Christian Theology and Technology in a Postmodern World, 136.
357 Borgmann, Power Failure: Christianity in the Culture of Technology, 17.
In Heidegger’s frame this clearly reveals that money for the company and shareholders and unlimited growth trump value for human life and enjoyment. Sam Wells aptly points out Dennis Snower’s work as part of the G20 Summit. “The world’s produced goods and services are growing at the expense of its social and environmental capital,” Snower’s aforementioned “dangerous decoupling.” He summarizes the situation like this:

“Economically, the problem manifests itself through rising inequalities. Socially, it comes as a crisis of identities, arising from two by-products of globalization: growing interactions with strangers (due to personal mobility and international competition for jobs) and the weakening of local social ties (due to the rise of global production, distribution and marketing networks and the fall in location-specific job security). Psychologically, the problem often takes the form of a perceived loss of life meaning. The resulting dissatisfaction of the relatively vulnerable social groups has generated rising nationalism, populism and cross-cultural intolerance in many countries, along with a falling appreciation of the benefits of democracy. This problem threatens to stoke social conflicts and undermine the legitimacy of the political and economic systems responsible for the rising worldwide material wealth, while simultaneously depleting more of our natural and social capital.”

Snower maintains that human identity lies in cooperation and innovation. He argues that our social connections rest on our capacity for “mentalizing (reading the thoughts of others), empathy (feeling the feelings of others), compassion (the desire to

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relieve the suffering of others), [and] loving-kindness (the desire to promote the happiness of others).”362 These capacities are about relationship and purpose.

The irony of this situation should be noted. Since the industrial revolution, people have been required to become machine-like in order to interact effectively with the machines they invented. When the machines did simple, repetitive tasks, the workers operating them needed to do simple, repetitive tasks as well. As machines became more versatile and programmable, workers were required to become more versatile, but only within the bounds of the existing programs. However, in the third digital revolution, people will be required to exercise the ability for sociality and discovery. Humans, in short, will have the opportunity to become more human again.363

Michael Ignatieff emphasizes tolerance, forgiveness, reconciliation, and resilience as building blocks to global coexistence. He maintains a widespread conviction that “displaying the virtues, as best you can, is the point and purpose of a human life.”364 Snower’s appeal brings urgency to this proposition. Who is better equipped to help bring humanity back to its true identity than the church? Borgmann describes how two cultures of contingency, the culture of the word and the culture of the table, have been replaced by cultures of commodity and control via device paradigm. The Church needs

362 Ibid, 7.
363 Ibid.
to develop and elaborate on how the beauty of Eucharist can be made relevant in such a cultural shift. This point about being human is more relevant to employees in technology giants. Blind’s survey of employees in companies like Microsoft, Uber, Google, Facebook and Apple found that 57.55% suffered from imposters syndrome.365

5.2.5 Nimbleness

There is much talk about technological trends and the future of progress. Those trying to predict the future of technology are bound to look like the village fool, given the fast pace of research and development in all aspects of life, which AI impacts. This offers the Christian community an opportunity to remain nimble in the face of developments that will come its way. The church should harness the scientific community within its ranks. The Christian community has a role to play in formulating and answering important questions, such as: what safety engineering policies and standards should be adopted in light of human worth? Who gets to decide on these policies? In whose image are Cyborgs built? How is the lifecycle of a cyborg to be considered, if she is the new creation? What is the impact of “winner takes all,” in the big technology world of AI? How will AI affect human esteem and life when it takes over the majority of jobs done by humans? If work gives purpose—as it was introduced

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before the fall in the Genesis narrative—what will replace it to give similar meaning and purpose to human life? Will the church set up separate funds for universal basic income? What practical programs in Sunday schools, conferences, and seminaries need to be introduced to train Christians in AI, and then in return to impact both the tech industry and government policy makers? When will the church be the go-to organization for advice and consultation on the implementation of AI? What interfaith partnerships does the church need to make with others outside its own fold to build a coalition to reestablish civilization? That is of course, if an AI apocalypse becomes a reality, as predicted in fiction. How can the church promote technology experts inside its community to work with leading academic researchers such as Roman Yampolskiy, Russell Stewart, the Carnegie Mellon University’s ethics forum, to name a few? What if the current field of narrow AI expands and is successful in general AI? Will Christians be equipped to handle the massive shift this will cause in how everything is done in the world? Sex robot brothels are already on the rise; how will this affect human relationships and the future of our planet?\(^6\) In Japan, we are already seeing a staggering number of people not engaging in sexual activity. Japan already has a birth rate crisis and an aging and dwindling population. Last year, the country recorded the lowest birth

rate in its history since it started recording births in 1899. Nevertheless, whose ethics, value system, and morality gets to be imbedded in AI? What uses of AI will the church exploit in the future? How will Christians keep seeking to “love him and our neighbors above all things” (Matthew 22:37-39) in the development of AI? How does this impact the church’s missional challenge in valuing, defending, and believing in its evangelistic outreach? What, if any, program should the church consider for AI research that might be underway in other countries that simply don’t have a Christian foundation? What are the limits and boundaries of AI-powered weapons? Should the church initiate a movement towards establishing a bill of rights for AI and humans? What is open for disagreement and what needs to be agreed upon at a cultural level? How will AI impact education?

The past decade has seen unprecedented economic growth, technological progress and ease of communication, and yet Yuval Levi argues about the crisis facing countless Americans: “The crisis is evident not only in our political and cultural interactions but in the personal lives of countless Americans, for whom hopelessness or

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alienation descends into outright despair. Although in some ways it is easier than ever to be in touch with others, ours is an era of unusual isolation and solitude.  

When trust in institutions, leaders, politicians and business is at all time low, the church finds itself well positioned to get involved, to engage, and to present the virtues that have molded the characters of people throughout the past two millennia.

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Appendix A

It is important examine developments in computer science through the last century. This is noteworthy because of 1950s fiction which seems to have turned into reality in the way its authors imagined the role of computers and Artificial Intelligence (AI) in human life.

In 1946 IBM unveiled its first large-scale digital calculating machine, known today as the IBM SSEC (Selective Sequence Electronic Calculator). Ten years later, in 1956, IBM then developed its first self-learning program, along with the first magnetic

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hard disk drive. Both these developments changed our world and computing forever. Afterwards, effort and resources were poured into the development of computer languages, memory production, and storage, with processors becoming smaller and faster, making them more user-friendly. The diagram above represents a timeline which chronicles these developments at the IBM.
### Appendix B

<table>
<thead>
<tr>
<th>AI Stack</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autonomy</td>
<td>AI technologies at this level focus on creating systems that make their own decisions without human intervention. These systems solve problems when humans can't. For example, robots can search through rubble for disaster survivors, or sensors in self-driving cars can respond more quickly to impending accidents than human drivers.</td>
</tr>
<tr>
<td>Human AI Interaction</td>
<td>When we create artificial intelligence in this part of the stack, we're augmenting what humans can do. These technologies make our lives easier. One good example of work in this area is robotic arms attached to motorized wheelchairs that people with spinal cord injuries can direct with their gaze. Another exciting example is research that allows a computer system to interview a patient remotely to determine if they're depressed and need human intervention.</td>
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<tr>
<td>Planning and Acting</td>
<td>Systems in this part of the stack rely on optimization, safety, the knowledge network, and strategic reasoning to make the best possible decision available and learn from the information researchers give them. Though slightly less sophisticated than systems employing...</td>
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<td>the blocks at the very top of the stack, planning and acting technologies still rely on advanced systems and algorithms to positively impact the world. One great example of technology that falls into this category is the national kidney exchange—a sophisticated algorithm that matches potential kidney donors with people who need transplants.</td>
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<tr>
<td>Decision Support</td>
<td>This layer includes technologies that help humans make decisions. Where should 500 Lyft drivers be deployed, based on information we know about events and demand? How should emergency services be distributed after a disaster? Exciting examples of research in this area include work to identify instances of human trafficking, help locate victims, and collect and synthesize enough information that trends and patterns can be discovered and used to combat the problem.</td>
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<tr>
<td>Modelling</td>
<td>AI systems at the top of the stack rely on computer modeling to understand information. Models use computers to construct and manipulate abstract representations of situations and natural phenomena in the world. For example, new research has allowed scientists to analyze photos of people to track their facial features and recognize their emotional states.</td>
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<tr>
<td>Machine Learning</td>
<td>Machine learning focuses on creating programs that learn from experience. It advances computing through exposure to new scenarios, testing and adaptation, while using pattern- and trend-detection to help the computer make better decisions in similar, subsequent situations. A relevant example of work in machine learning is using speech recognition technologies to identify the age, sex, and location of the hoax callers that plague the U.S. Coast Guard.</td>
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<tr>
<td>Computing</td>
<td>All artificial intelligence is built on the computer systems that came before it. This includes the systems, networks, programming languages, operating systems, and interactions between devices that make computing possible.</td>
</tr>
</tbody>
</table>
Appendix C

Ethics guidelines for AI by country of issuer (Australia–UK)

<table>
<thead>
<tr>
<th>Name of document/institute</th>
<th>Issuer</th>
<th>Country of issuer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whistleblower Declaration: Responsible AI</td>
<td>Australian Worker</td>
<td>Australia</td>
</tr>
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<td>Work in the Age of Artificial Intelligence: Four Perspectives on the Economy, Employment, Skills and Ethics</td>
<td>Ministry of Economic Affairs and Employment</td>
<td>Finland</td>
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<td>Euros A1AI Ethics Guidelines</td>
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<td>Finland</td>
</tr>
<tr>
<td>Commitments and Principles</td>
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<td>Finland</td>
</tr>
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<td>For AI: Meaningful and Artificial Intelligence. Towards a French and European Strategy</td>
<td>Mission Villars</td>
<td>France</td>
</tr>
<tr>
<td>Ethics and the Rebirth of Robotics</td>
<td>CEIRAA (Ifremer)</td>
<td>France</td>
</tr>
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<td>AI Guidelines: Germany</td>
<td>Deutsche Telekom</td>
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<td>SAP’s Guiding Principles for Artificial Intelligence</td>
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<td>Germany</td>
</tr>
<tr>
<td>Automated and Connected Driving Report</td>
<td>Federal Ministry of Transport and Digital Infrastructure, Ethics Commission</td>
<td>Germany</td>
</tr>
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<td>Discussion Paper: National Strategy for Artificial Intelligence</td>
<td>National Institute for Transforming India (NITI Aayog)</td>
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<td>Ethics for Artificial Intelligence</td>
<td>Italian Academy of Sciences</td>
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</tr>
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<td>The Japanese Society for Artificial Intelligence Ethics Guidelines Report on Artificial Intelligence and Human Society (Unofficial translation)</td>
<td>Japanese Society for Artificial Intelligence Advisory Board on Artificial Intelligence and Human Society (Initiative of the Minister of Science and Technology Policy)</td>
<td>Japan</td>
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<td>Draft AI R&amp;D Guidelines for International Discussions</td>
<td>Institute for Information and Communications Policy (ICP), The Conference toward AI Network Society</td>
<td>Japan</td>
</tr>
<tr>
<td>Sony Group AI Ethics Guidelines: Sony</td>
<td>Sony</td>
<td>Japan</td>
</tr>
<tr>
<td>Human Rights in the Robot Age Report</td>
<td>The Pathways Institute</td>
<td>Netherlands</td>
</tr>
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<td>Dutch AI/Artificial Intelligence Manifesto</td>
<td>Special Interest Group on Artificial Intelligence (SIGAI), ICT Platform Netherlands (IPN)</td>
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</tr>
<tr>
<td>Artificial Intelligence and Privacy</td>
<td>The Norwegian Data Protection Authority</td>
<td>Norway</td>
</tr>
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<td>Discussion Paper on Artificial Intelligence (AI) and Personal Data—Fostering Responsible Development and Adoption of AI</td>
<td>Personal Data Protection Commission Singapore</td>
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<tr>
<td>UK: To Long Term Vision Paper in Preparation for the Intelligent Information Society</td>
<td>Government of the Republic of Korea</td>
<td>South Korea</td>
</tr>
<tr>
<td>AI Principles of Telefónica</td>
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<td>Spain</td>
</tr>
<tr>
<td>AI Principles &amp; Ethics</td>
<td>Emergent Ethics</td>
<td>UAE</td>
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<td>Principles of robotics</td>
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<td>UK</td>
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<tr>
<td>The Ethics of Codifying AI for Business</td>
<td>Sage</td>
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</tr>
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<td>Big Data, Artificial Intelligence: Machine Learning and Data Protection</td>
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<td>UK House of Lords, Select Committee on Artificial Intelligence</td>
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<tr>
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</tr>
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<td>Ethics Framework: Responsible AI</td>
<td>Machine Intelligence Garage Ethics Committee</td>
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<td>Responsible AI and Robotics: An Ethical Framework</td>
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<td>Machine Learning: The Power and Promise of Computers That Learn by Example</td>
<td>The Royal Society</td>
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<tr>
<td>Ethics, Social, and Political Challenges of Artificial Intelligence in Health</td>
<td>Future Advisory</td>
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</tr>
</tbody>
</table>

Appendix D

Ethics guidelines for AI by country of issuer (USA, international, EU and N/A)

Table 2 Ethics Guidelines for AI by Country of Issuer (USA, International, EU and N/A),


167
Bibliography


171


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186


191


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Biography

Timothy Kasbe is a Dalit Christian born in a missionary family and serves in the Anglican communion. His parents have worked with the Poona and Indian Village Mission since 1955 building churches, schools and leprosy hospitals in rural Western India. His only sister is involved in Bible translation and church planting work. Timothy chose to break the family tradition and moved into secular work after studying engineering. He has held executive positions globally serving as the Chief Information Officer at Reliance Industries Limited, Mumbai; Sears Holdings, Chicago; Intrexon, San Francisco; Gloria Jeans Company, Russia and IBM, New York, to name a few. With his wife Amber, they have served as foster parents with Safe Families, USA, Detski Dom, Russia and Oranga Tamariki, New Zealand. Timothy was a founding member of the Good Shepherd Schools in India and has served as an advisor to Chabad House and the Salvation Army in Russia, and Youthline in New Zealand.