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# BECOMING DATA, ENHANCING HUMANITY: HOW TECHNOLOGY AND TRANSHUMANISM CHALLENGE CHRISTIAN THEOLOGY AND ANTHROPOLOGY

JOSEPH T. COCHRAN[1]

A disenchanted Moody Bible Institute student, Meghan O'Gieblyn, dropped out of Bible school and became enamored with Posthumanism and Transhumanism. Her April 2018 article in the Guardian is a tantalizing exposé on the danger and allure of these ideas.[2] Though she became disillusioned with them, her story reveals that Posthumanism and Transhumanism are an influential and viable alternative to the Christian worldview. What is Posthumanism and Transhumanism? Jacob Shatzer's definitions are helpful. Posthumanism is the idea that "there is a next stage in human evolution." This stage may be guided through the use of technology. "Transhumanism… promotes values that contribute to this change."[3]

This essay introduces new horizons of study in the realms of technology and science. It suggests that technological advances challenge Christian scholars and pastors to readdress theological topics that these advances affect. The first section looks at scientific fields of study involving data, intelligence, and environments in order to introduce these developments and suggests further research opportunities for pastor-theologians. The second section addresses human enhancement, which in some way interplays in all three areas of data, intelligence, and environments. This article argues that pastors and theologians should take the objectives of Posthumanists and Transhumanists seriously. Their aims may appear to be the preoccupations of adults who never outgrew a childhood fantasy with science fiction. However, their objectives, propositions, and forecasts produce ethical dilemmas and present real challenges to Christian theology and what it means to be human. Many of these objectives might be achieved before the close of the twenty-first century, which adds urgency to the task of responding to them.

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[1] Joey Cochran is a PhD Candidate at Trinity Evangelical Divinity School in Deerfield, Illinois.

2 Meghan O'Gieblyn, "God in the Machine: My Strange Journey into Transhumanism," The Guardian, April 2017, https://www.theguardian.com/technology/2017/apr/18/god-in-the-machine-my-strange-journey-into-transhumanism (accessed February 20, 2019).

[3] Jacob Shatzer, *Transhumanism and the Image of God* (Downers Grove: Intervarsity Press, 2019), 16.

This is a futile task if Christian scholars and pastors remain unaware of philosophical and scientific developments in technology and how they shape everyday life. Throughout church history, theologians were conversant with thinkers from other worldviews and concerned about how those worldviews affected their own. Pastors' bookshelves are often filled with works from Augustine, Aquinas, Calvin, and Edwards. Perhaps it is a helpful reminder that Edwards' shelves contained Locke, Berkley, and Hutcheson, among others.[4] Today's pastor-theologians ought to be familiar with those who work on complex ethical, philosophical, and practical dilemmas that scientific advances introduce to the world. After all, these advances have immense bearing on scriptural interpretation and theological construction. In truth, if pastors and scholars do not include today's philosophical and ethical technologists as interlocutors, they will have to reckon with being caught unaware and unprepared for what the rest of the twenty-first century holds for humanity.[5]

Many who encounter this information will assume these ideas are appropriated from future myths, whether from mythological universes like Star Wars, Star Trek, Marvel, or others within the film industry. The juxtaposition of Silicon Valley with Hollywood is not incidental. Could it be that Hollywood introduces ethical dilemmas and implications of technological advances in order to prepare the public for what is to come? Perhaps this is why many 2019 Super Bowl commercials introduced the public to artificial intelligence? Perhaps this is why we were smitten with

[4] On Jonathan Edwards' engagement of the Enlightenment, British Moral Philosophy, and other worldviews see William S. Morris, *The Young Jonathan Edwards: A Reconstruction*, The Jonathan Edwards Classic Studies Series (Eugene: Wipf and Stock, 1955, 2005); Jonathan Edwards, *Catalogues of Books, The Works of Jonathan Edwards, Volume 26,* ed. by Peter J. Thuesen (New Haven; London: Yale University Press, 2008); Jonathan Edwards, *Scientific and Philosophical Writings, The Works of Jonathan Edwards, Volume 6,* ed. by Wallace E. Anderson (New Haven; London: Yale University Press, 1980); Norman Fiering, *Jonathan Edwards's Moral Thought and Its British Context*, The Jonathan Edwards Classic Studies Series (Eugene: Wipf and Stock, 2006); Gerald R. McDermott, *Jonathan Edwards Confronts the Gods: Christian Theology, Enlightenment Religion, and Non-Christian Faiths, Religion in America* (Oxford; New York: Oxford University Press, 2000). Josh Moody, Jonathan Edwards and the Enlightenment (Lanham: University Press of America, 2005).

[5] Michael S. Burdett is on the cutting edge of considering the intersection between the technological future and theology. He contended, "While I would suggest that not enough attention has been devoted to technology, there has been a vibrant tradition that has significantly contributed to Christian reflection on technology and the future" (Michael S. Burdett, *Eschatology and the Technological Future* [Routledge Studies in Religion. New York: Routledge, 2015], 1). Others engaging the intersection of theology and Transhumanism include: Ronald Cole-Turner, *Transhumanism and Transcendence: Christian Hope in an Age of Technological Enhancement* (Washington, D. C.: Georgetown University Press, 2011); Douglas Estes, *Braving the Future: Christian Faith in a World of Limitless Tech* (Harrisonburg: Herald Press, 2018); Jacob Shatzer, *Transhumanism and the Image of God*; Jeanine Thweatt-Bates, *Cyborg Selves: A Theological Anthropology of the Posthuman* (Burlington: Ashgate, 2012); Brent Waters, *From Human to Posthuman: Christian Theology and Technology in a Postmodern World* (Burlington: Ashgate, 2006).

the puppy-like friendship between BB8 and Rey in Star Wars, or a little discomforted by the sexual tension between Lando Calrissian and L3-37? Perhaps this is why Ready Player One and Alita Battle Angel captured the fascinations of young adult audiences? These illustrations from the film industry confront rising generations with the ethical quandaries regarding technological advances. Max Borders may be correct when he asserted: "science fiction is often the first step to innovation."[6] The assertions that drive this research are not derived from the film industry. Rather, the interlocutors throughout this study include top minds in the fields of technology and science. They are today's philosophers and ethicists who work to develop and protect the technological future. Some are Posthumanists and Transhumanists. Others are critics. While this essay does its best to accurately present the views of Posthumanism and Transhumanism, it is not affirming of those views. Rather, the aim is to introduce pastor-scholars to developments in this worldview and invite them to engage with these interlocutors in a productive manner.

## DATA, INTELLIGENCE, ENVIRONMENTS

Are humans becoming data? Have they always been data and not known it? Many technologists believe both are the case.[7] This assertion should trouble many Christians. Nonetheless, the task of a Christian scholar and pastor is to help congregants navigate these kinds of assertions. Advances in scientific areas of data, intelligence, and environments apply pressure to Christianity's biblical and theological foundation and risk creating cracks and fissures in its foundation. Each of these three areas have corollaries in major branches of theology. Data's corollary is within the realm of authority and interrelates with Scripture. The consequences of advances in intelligence research tend towards blurring the creator-creature distinction. Thus,

[6] Borders, *The Social Singularity*, loc. 1594.

[7] Cf. Ethem Alpaydin, *Machine Learning,* The MIT Press Essential Knowledge Series (Cambridge: MIT Press, 2016); Max Borders, *The Social Singularity: A Decentralist Manifesto* (Austin: Social Evolution, 2018); Erik Brynjolfsson and Andrew McAfee, *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies* (New York: Norton, 2014, 2016); John Cheney-Lippold, *We Are Data: Algorithms and the Making of Our Digital Selves* (New York: New York University Press, 2017); Pedro Domingo, *The Master Algorithm: How the Quest for the Ultimate Learning Machine Will Remake the World* (New York: Basic Books: 2015); John D Kelleher and Brendan Tierney, *Data Science*, The MIT Press Essential Knowledge Series (Cambridge: MIT Press, 2018); Ray Kurzweil, *The Age of Spiritual Machines: When Computers Exceed Human Intelligence* (New York: Penguin, 1999); Ray Kurzweil, *The Singularity Is Near: When Humans Transcend Biology* (New York: Penguin, 2005); Steve Lohr, *Data-ism*: *The Revolution Transforming Decision Making, Consumer Behavior, and Almost Everything Else* (New York: Harper Collins, 2015); Murray Shanahan, *The Technological Singularity,* The MIT Press Essential Knowledge Series, (Cambridge: MIT Press, 2015); Susan Schneider, ed, *Science Fiction and Philosophy: From Time Travel to Superintelligence, second edition* (Malden: Wiley-Blackwell, 2016); Chris Skinner, *Digital Human: The fourth revolution of humanity includes everyone* (Malden:Wiley-Blackwell, 2018).

intelligence studies correlate to studies in theology proper and theological anthropology. Technological progress in the realm of environments impact what constitutes this world, other worlds, and heaven and hell. All three advances give cause for philosophical, ethical, and theological reflection.

## DATA

In the midst of the COVID-19 global crisis, the key health advisor to President Trump's administration, Dr. Deborah Birx, made the following remarks about the supremacy of data during an interview with the Christian Broadcast Network:

> What the president has asked us to do is to assemble all the data and give him our best medical recommendation based on all the data…This is consistent with our mandate to really use every piece of information that we can in order to give the president our opinion that's backed up by data…He's been so attentive to the scientific literature and the details and the data…I think his ability to analyze and integrate data that comes out of his long history in business has really been a real benefit during these discussions about medical issues because in the end, data is data.[8]

The *fin-de-siècle* of the twentieth century ushered in the primacy of data. Global circumstances in the early twenty-first century reveal how much certainty, salvation, happiness, and hope depend upon data. Data has become king. In premodern Christianity, the devout turned to the authority of the church and Scripture to inform them how to live. In the modern period rational man looked inward toward reason to answer questions once answered by the Bible. The former looked outside of the self to derive authority and found it in divine revelation. The latter found authority within the self and derived it from a rational response to sense experience. This epistemological turn eliminated the need for external authority, like divine revelation, in order to interpret and navigate reality. Many advances occurred by turning to the authority of human reason. However, as time progressed, humanity proved to be a poor, impartial arbiter of truth.[9]

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[8] Quoted from the associated press, "Virus coordinator Birx is Trump's Data Whisperer," US News and World Report, March 28, 2020, https://www.usnews.com/news/politics/articles/2020-03-28/virus-coordinator-birx-is-trumps-data-whisperer (accessed March 30, 2020).

[9] This "Age of Reason" experienced rapid shifts in biblical authority and interpretation as critical interpretive methods developed. Some such as Jason A. Josephson-Storm underplay the significance of disenchantment during this era (*The Myth of Disenchantment: Magic, Modernity, and the Birth of the Human* Sciences [Chicago; London: Chicago University Press, 2017], 41-62). Otherwise, see the following on the shift from biblical authority to empiricism and skepticism: Gerald R. Cragg, *The Church and the Age of Reason, 1648-1789* (New York: Penguin, 1960), 47; Paul Hazard, *The Crisis of the European Mind 1680-1715* (New York: The New York Review of Books, 1961); Hans Frei, *The Eclipse of Biblical Narrative: A Study in Eighteenth and Nineteenth Century Hermeneutics* (New Haven: Yale University Press,

This could be one explanation for Tom Nichols' assertion about the death of expertise.[10] Expert thinkers are human thinkers, and human thinkers are capable of errors in judgment and fact. On the other hand, many argue that cold sterile facts and data are free from human error. Perhaps the campaign against established knowledge is because data is more trustworthy than human rationale.

Indeed, many have turned outward from human rationale to regain a confident knowledge base. Just as God revealed Scripture from the clouds above, people turn upward to where data is stored in the digital cloud.[11] Rather than turning to divine truth, people frequently rely upon empirical data to ask complex questions about meaning and life and to handle those everyday questions. Whether people adopt a post-Christian or Christian worldview, this is increasingly their reality. Data helps people decide political candidates, and it helps them get to the pharmacy. Data helps people decide whether to have a major heart surgery, and it helps them pick what movie to watch. What makes data so powerful is its *network effect*.[12] More people rely on data every day to shape their lives. As they do so, data becomes a powerful engine to drive, control, and assert authority over them. Fundamentally, this is the concept of dataism, which is perhaps the largest

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1974); John Redwood, *Reason, Ridicule and Religion: the Age of Enlightenment in England* (Cambridge: Harvard University Press, 1976); Henry F. May, *The Enlightenment in America* (New York; Oxford; Oxford University Press, 1978); John Hedley Brooke, *Science and Religion* (Cambridge: Cambridge University Press, 1991, 2014), 158-260; Dale K. Van Kley, *The Religious Origins of the French Revolution: From Calvin to the Civil Constitution, 1560-1791* (New Haven; London: Yale University Press, 1995), 75-76, 241-48; Roy Porter, *The Creation of the Modern World: The Untold Story of the British Enlightenment* (New York: W. W. Norton & Company, 2000); Louis Dupré, *The Enlightenment and the Intellectual Foundations of Modern Culture* (New Haven; London: Yale University Press, 2004); Jonathan Sheehan, *The Enlightenment Bible: Translations, Scholarship, Culture* (Princeton; Oxford: Princeton University Press, 2005); Richard B. Sher, *The Enlightenment and the Book: Scottish Authors and Their Publishers in Eighteenth-Century Britain, Ireland and America* (Chicago; London: Chicago University Press, 2006); David Steinmetz, "Superiority of Pre-critical Exegesis" in *Taking the Long View: Christian Theology in Historical Perspective* (New York: Oxford University Press, 2011), 3; Michael C. Legaspi, *The Death of Scripture and the Rise of Biblical Studies* (New York: Oxford University Press, 2010); Dorinda Outram, *The Enlightenment, third edition,* New Approaches to European History (Cambridge: Cambridge University Press, 2013); Charly Coleman, "Religion" in *The Cambridge Companion to the* Enlightenment, ed. by Daniel Brewer (Cambridge: Cambridge University Press, 20014), 105-121; John Robertson, *The Enlightenment: A Very Short Introduction* (New York; Oxford: Oxford University Press, 2015).

[10] C.f. Tom Nichols, *The Death of Expertise*, 1-7.

[11] Though, in reality, all this data is solidly stored here on earth in large data centers filled with innumerable servers all over the globe. This quip about dataism is adopted from Yuval Noah Harari's talk at the WEF Annual Meeting 2018, "Will the Future Be Human?", https://www.youtube.com/watch?v=npfShBTNp3Q (accessed Feb 18, 2019).

[12] Brynjolfsson and McAfee used the Waze app to describe the power of *network effect*. "That waze gets more useful to all of its members as it gets more members is a classic example of what economists call a *network effect*—a situation where the value of a resource for each of its users increases with each additional user" (*The Second Machine Age*, 60).

threat of authority that theism has encountered.[13] Steve Lohr, a journalist with the New York Times, said this about dataism:

> Indeed, the long view of the technology is that it will become a layer of data-driven artificial intelligence that resides on top of both the digital and the physical realms. Today, we're seeing the early steps toward that vision. Big-data technology is ushering in a revolution in measurement that promises to be the basis for the next wave of efficiency and innovation across the economy. But more than technology is at work here. Big data is also the vehicle for a point of view, or philosophy, about how decisions will be—and perhaps should be—made in the future.[14]

As people rely on data to inform their decisions, they inevitably find theism dispensable. This begets the fall of theism and supremacy of dataism.

In many ways people have voluntarily abdicated their authority and submitted themselves to data's authority. Data decides the next date or next car. It decides the next vacation, job, or spouse. Data tells people what to think about history, economics, politics, and sociology. Doctors collect data from people's bodies and return data to them to help them decide how to prolong and produce the healthiest life possible. Smart phone and Apple™ watch apps substitute for doctors.[15]

Many technological futurists believe that if researchers produce the correct study and input a substantially sufficient amount of data, then an output will definitively answer any research problem. This is the basis of the emerging field of data science. Data science exists to "improve decision making by basing decisions on insights extracted from large data sets." John Kelleher asserted, "Today, data science drives decision making in nearly all parts of modern societies."[16] Businesses leverage the internet to collect, store, process, and analyze large amounts of data through social media and user's web-surfing habits. This process has created the industry of data science, and it is used to forecast market needs and suggest user behavior.

Data science employs machine learning to maximize its affect. Machine learning is the science of designing and evaluating algorithms for discovering and interpreting patterns of data.[17] Machine learning produces models of data that aim at creating regressions (an estimation of an output), which

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[13] On the concept of dataism see: John Cheney-Lippold, *We Are Data: Algorithms and the Making of Our Digital Selves* (New York: New York University Press, 2017); Steve Lohr, *Data-ism: The Revolution Transforming Decision Making, Consumer Behavior, and Almost Everything Else* (New York: Harper Collins, 2015).

[14] Steve Lohr, *Data-ism*, 3. Steve cred. his colleague David Brooks of the New York Times for coining the term data-ism and the mindset entailed in the meaning of the term.

[15] Martin Rees off-handedly predicted the Apple™ Watch in *Our Final Hour* (published 2003): "Even within ten years, wristwatch-size computers will link us to an advanced internet and to the global positioning system" (Rees, *Our Final Hour*, 16).

[16] John D. Kelleher, *Data Science*, 1.

[17] John D. Kelleher, *Data Science*, 1.

is a form of supervised learning. If a model is a successful predictor of an output it has a strong generalization ability.[18] Data scientists use machine learning to produce pattern recognition. Applications for pattern recognition include character recognition for AI reading, facial recognition, speech recognition, natural language processing and translation.[19] The power harnessed by data science and machine learning has reshaped much of life.

Many philosophers believe that all of life's questions could be answered by applying the correct algorithm.[20] Input enough data and the most beneficial output will reduce pain and maximize human pleasure. Christian scholars and pastors should anticipate how this kind of claim might turn against a Christian worldview. Why couldn't data and algorithms supplant a savior? Why need Jesus Christ when there is a master algorithm? Perhaps a master algorithm could rescue humanity from its base problems—famine, plague, war, and death? Why need pastors when you have data scientists? Data scientists can expertly organize, categorize, and control data to help plan purchases, travels, finances, and business ventures. Data scientists are great consultants for marital, emotional, and spiritual well-being. All data scientists need is access to people's data in order to offer solutions to these questions. People already create a substantial data print every day just by surfing the web, responding to notifications, and participating in social media.[21] All this data could be used by data scientists to help order every aspect of life.

Whereas premodern theism and modern rationalism were both derivative, data has become so powerful that it can learn, predict, and execute outcomes. Data is generative.[22] As more ways to collate large amounts of data are produced through advances in hardware and software, data is empowered with the capacity to be intelligent. If generative data is empowered with intelligence, then it will be an authority structure fundamentally different from Scripture. Scripture is a text, and it is a revealed text from God.[23] As a

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[18] Alpaydin, *Machine Learning*, 40-47.

[19] Alpaydin, *Machine Learning*, 60-74.

[20] Alpaydin, Machine Learning, 60-74; Cheney-Lippold, *We Are Data*; Domingo, *The Master Algorithm*; Harari, *21 Lessons for the 21st Century*; Kelleher and Tierney, *DataScience*; Lohr, *Data-ism*; Shanahan, *The Technological Singularity.*

[21] Chris Skinner, *Digital Human*, 105, 117.

[22] Alpaydin said: "An approach that has recently become very popular in data analysis is to consider a generative model that represents our belief as to how the data is generated. We assume that there is a hidden model with a number of hidden, or latent, causes that interact to generate the data we observe. Though the data we observe may seem big and complicated, it is produced through a process that is controlled by a few variables, which are the hidden factors, and if we can somehow infer these, the data can be represented nd nderstood in a much simpler way. *Such a simple model can also make accurate predictions*" (*Machine Learning*, 65-66).

[23] That said, God's revelation is not reduced to his special, closed, and canonical revelation in Scripture. Helpful texts for studying the doctrine of revelation, canonicity, and the limits of canonical revelation include: Kevin J. Vanhoozer, *Is There A Meaning in This Text*

canonical text, it is closed revelation.[24] Truth is derived from Scripture, but Scripture does not reveal or generate new truth.[25] Data once was subject to human interpretation, much like the Bible. However, technologists assert that data is now a generative, intelligent source using complex algorithms developed by advances in machine learning and data science. It no longer functions or relies on human interpretation, unlike Scripture.

If these assertions about data are correct, then dataism contends against Scripture as an epistemological authority. The authority of Scripture will likely be undermined by the authority of data in the coming century. Partly this is because the other elements of technological advancement—intelligence and environments—are becoming so altered that the content of Scripture and its culture present a challenge to correspond the biblical world with the technological future. On the other hand, data is a native source of authority for the present culture, which makes it all the more equipped to navigate today's questions.

In reference to the issue of authority, the most pressing question pastor-scholars must ask today regards how to preserve the authority of Scripture and proffer its usefulness in a world that seems to dismiss it as antiquated and useless. Follow up questions include: How to protect God's people from the temptation to exchange the authority of Scripture for the authority of data? What is the place of data as an authority? If Scripture alone is the infallible authority for Christians, can data come alongside church history and tradition to augment the authority of Scripture? If so, how does big data and its intelligibility integrate with the doctrine of Scripture? Could people leverage big data, machine data, and data systems to better understand biblical data?[26]

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(Grand Rapids: Zondervan, 1998); John Webster, *Holy Scripture: A Dogmatic Sketch,* Current Issues in Theology (Cambridge: Cambridge University Press, 2003); Kevin J. Vanhoozer, *The Drama of Doctrine: A Canonical Linguistic Approach to Christian Doctrine* (Louisville: Westminster John Knox Press, 2005); John M. Frame, *The Doctrine of the Word of God, A Theology of Lordship, Volume 4* (Phillipsburg: P&R: 2010); Kevin J. Vanhoozer, *Remythologizing Theology: Divine Action Passion, and Authorship* (Cambridge: Cambridge University Press, 2010); John Webster, *The Domain of the Word: Scripture and Theological Reason* (Edinburgh: T&T Clark, 2012); Matthew Levering, *Engaging the Doctrine of Revelation: The Mediation of the Gospel through Church and Scripture* (Grand Rapids: Baker Academic, 2014).

[24] On the idea that the canon of Scripture is closed, most Christian scholars appeal to Revelation 22:18–19.

[25] See 2 Timothy 3:16–17. This is why the Scripture principle or Analogy of Scripture is vital to the doctrine of special revelation. This principle emphasizes the significance of letting unambiguous Scripture interpret ambiguous Scripture. For discussion on *analogia Scripturae* see, Richard A. Muller, *Dictionary of Latin and Greek Theological Terms* (Grand Rapids: Baker, 1985, 1986), 33.

[26] Software like Logos and Accordance pave the way for this kind of integration.

## INTELLIGENCE

There are a few ways to speak about intelligence research and a few methodological approaches that scientists take on the biological and the technological sides of this field of research. Before introducing these approaches, a simple assertion needs to be made. Industry leaders in biomedical and technological development are pouring out millions, even billions of dollars in research development for this field.[27] They have their reasons for doing so. One of those reasons is to evade the inevitable "terror"—death.

Shanahan argued that "any intelligent agent, whether artificial or biological, can be analyzed according to its structure."[28] This entails responding to three questions: 1) What is the intelligent agent's reward? 2) How does the intelligent agent learn? 3) How does the intelligent agent maximize its expected reward? Researchers developing artificial intelligence are concerned about the level of artificial intelligence that is being fabricated. Animal-, human-, and super-intelligence are three grades of intelligence that roboticists are developing in the coming decades.

Advances in intelligence may be achieved by advancing the human mind. This may include integrating tech or leveraging medicine and organic technologies to strengthen the human mind. Intelligence development may restrict itself to the realm of technology and robotics, either attempting some sort of whole brain emulation or creating a wholly different infrastructure for intelligence, what some refer to as "AI from scratch." Since humanity's familiarity with general intelligence comes from the human infrastructure of a body and mind, many believe that whole brain emulation is the path forward for developing artificial intelligence.[29] Since studies indicate that the human mind and body are interdependent, some of those who wish to achieve artificial intelligence suggest we must account for the fact that the

[27] The headline from a March 2017 MIT Review article demonstrated this: "The Entrepreneur with the $100 Million Plan to Link Brains to Computers" (Antonio Regalado, "The entrepreneur with the $100 million plan to link brains to computers," MIT Technology Review, March 2017, https://www.technologyreview.com/s/603771/the-entrepreneur-with-the-100-million-plan-to-link-brains-to-computers/ [accessed, February 20, 2019]). Ray Kurzweil, leading Transhumanist and author of *The Age of Spiritual Machines* and *The Singularity Is Near* has unrestricted funding from Google Corp. as the director of engineering and founder of the Singularity University.

[28] Shanahan, *The Technological Singularity*, 77.

[29] Shanahan, *The Technological Singularity*, 160. Kurzweil predicted that we would get there by 2015, which did not occur. His prediction was based on a projection where IBM's Blue Gene/P supercomputer would have one million gigaflops, which would be 1/10 of the $10^{16}$ calculation per second computational power needed to power an AI full-brain emulation (Kurzweil, *The Singularity Is Near*, 71). On the other hand, David Chalmers imagined that we're still a ways out, but to him it's a matter of decades and whole-brain emulation should be achieved before the close of the twenty-first century ("The Singularity: A Philosophical Analysis" in *Science Fiction and Philosophy*, 175-176).

human mind is housed in a human body. Thus, it makes sense to design an embodied artefact to house artificial intelligence.

However, this technique may only bring artificial intelligence to the same level as human intelligence. Many researchers wish to advance intelligence beyond human intelligence. They assume that once AI reaches human intelligence level, it will quickly advance beyond that level. This is called superintelligence. There are strong philosophical arguments that assume if artificial intelligence can exceed human intelligence, then there is the prospect of recursive self-improvement. The superintelligent being exponentially advances its intelligence, creating an intelligence explosion, which has been dubbed "the Singularity."[30] If this intelligence explosion occurs, then strategies have to be in place to contain the power of superintelligence. Some techniques may include housing the reward function of the superintelligent being with a need to protect and value human-level intelligence and reward it for doing so.[31]

Another factor to consider in the area of intelligence development is the role that consciousness plays.[32] Phenomenology will have a bearing on the kinds of rights that prospective artificial intelligences have. If scientists are able to duplicate human intelligence, then it will likely be a fully-orbed, feeling and sensing intelligence. If a truly conscious artificial intelligence is fabricated, consideration of how to minimize the pain and maximize the pleasure of this intelligence will be vital.

Scientists, philosophers, and ethicists wrestle with the ethical dilemmas that might unfold as a result of developing these kinds of intelligences.[33]

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[30] Kurtzweil, *The Age of Spiritual Machines*; Kurtzweil, *The Singularity Is Near.*

[31] Nick Bostrom, *Superintelligence*, 185-187. Bostrom discussed ways to program a "decision rule" and "utility function" within pre-superintelligent artificial intelligence in order to value human values, including human life before it reaches superintelligent capacity. This prevents human intelligent agents from being in the scenario where they must take down the superintelligent being through brainwashing, replacement, or extermination.

[32] Some introductory discussions on consciousness include: Nick Bostrom, *Superintelligence*, 159-176; Brynjolfsson and McAfee, *The Second Machine Age*, 254-56; David J. Chalmers, Chapter 16, "The Singularity: A Philosophical Analysis" in *Science Fiction and Philosophy*, 201-204; Murray Shanahan, The Technological Singularity, 117-149; Joshua Shepherd, Consciousness and Moral Status (Routledge Focus. New York: Routledge, 2018); Susan Schneider and Max Velmans, eds, The Blackwell Companion to Consciousness, second edition (Malden: Wiley-Blackwell, 2017); Susan Schneider, Chapter 17, "Alien Minds" in Science Fiction and Philosophy, 229-234; Zoltan L. Torey, The Conscious Mind, The MIT Press Essential Knowledge Series (Cambridge: MIT Press, 2014).

[33] David Chalmers commented: "If there is AI++, it will have an enormous impact on the world. So if there is even a small chance that there will be a singularity, we need to think hard about the form it will take. There are many different forms that a post-singularity world might take. Some of them may be desirable from our perspective, and some of them may be undesirable" ("The Singularity: A Philosophical Analysis" in Science Fiction and Philosophy, ed. by Susan Schneider, 190).

What safeguards are put in place in order to prevent a super-intelligent being from oppressing or supplanting humanity?[34]

Though this section is cursory, it introduces a number of conundrums for the Christian worldview. At what point does human-level artificial intelligence require reconsideration to whom salvation and the gospel is applied? Just as C. S. Lewis reflected on whether hypothetical extra-terrestrials might be spiritual creatures in need of redemption, is it possible that human-level AI may be spiritual creatures in need of redemption?[35] Why or why not? If human-level AI achieves the status of having consciousness, with all the accompanying sensory hardware, should these beings be barred from church membership? Will they be able to attend services like an American slave during the Sixteenth and Seventeenth-century? Would AI partake in the sacraments?[36] What would a pastor say to a human and AI couple seeking marriage?[37] At what point does a super-intelligent being with recursive self-improvement become essentially all-knowing and all-powerful?

## ENVIRONMENTS

There are two major environments to consider in respect to technological advances. The first is inter-planetary colonization. The second is alternate reality. These two habitations for humanity will become more attractive as humans consume and deplete earth's natural resources and escalate the current ecological and energy crises.[38] Of course this is a dystopian projection regarding future-earth, which informs the function that these two environments fulfill. For many, these two environments present the potential of technological utopias.

Though it might be feasible for humans to colonize the galaxy, the best hope for interplanetary exploration is to develop consecutively advancing levels of artificial intelligence. At least this is what has been done so far with the Lunar and Mars Rovers.[39] Nonetheless, initiatives exist to colonize Mars.

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[34] Cf. Eliezer Yudkowsky, "Artificial Intelligence as a positive and negative factor in global risk" in *Global Catastrophic Risk*, ed. by Nick Bostrom and Milan M. Cirkovic (New York: Oxford University Press, 2008), 308-345.

[35] C. S. Lewis published an essay response to F. B. Hoyle in the Christian Herald called "Will We Lose God in Oute89r Space." Later this essay was republished as "Religion and Rocketry" in a collection of essays called *The World's Last Night*. In this essay he explores whether there could be "spiritual animals" on other planets in need of redemption (C. S. Lewis, *The World's Last Night and Other Essays* (New York: Harper One, 1952) 87-97.

[36] On slavery, Christian status, and the sacraments, see especially Katharine Gerbner, *Christian Slavery* (Philadelphia: University of Pennsylvania Press, 2018).

[37] This question might cause chagrin for some, but a similar response might have been had during the eighteenth, nineteenth, and even early twentieth-centuries in reference to homosexual couples seeking marriage.

[38] Burdett made this same observation (Burdett, *Eschatology and the Technical Future*, 1).

[39] NASA declared Mars Rover Opportunity's mission closed on February 13, 2019 ("Nasa's Record-Setting Opportunity Rover Mission on Mars Comes to End," Nasa, Feb 13, 2019, https://www.nasa.gov/press-release/nasas-record-setting-opportunity-rover-

Scientists are exploring ways to successfully land there and establish a base camp.[40] As AI research continues, a better understanding of the limitations and opportunities for further space exploration with AI become clearer.

Christian pastors and scholars should consider what it means for humans to explore other planets. Does this call for an inter-planetary mission movement? Who will go and how will these astronaut-missionaries train for space exploration? Will those who go tolerate ecclesiological differences because there is a lack of multiple expressions of faith and denominations on colonized planets?

Christians will have to account for the environment of alternate reality.[41] More of reality appears to be occupied with screen time. Many integrate tech on their bodies and always have it with them. With the expansion of networked reality, where all of space collapses due to a global computing network, humanity has the potential to strip itself from the bounds of space.[42] People do not have to sit across from one another to have a conversation. They can interact with one another via phone, e-mail, video-chat, social media, or other mediums. All of these mediums make materiality less essential or fundamental to human interaction.

A recent innovation of this sort is the Oculus Rift. Oculus.com's website has the tag "With 1000+ apps, meet up in VR, watch with friends, listen to music, play games and more."[43] Once goggles are applied, wearers slip into an alternate reality. More technology like this will reach the market with an end goal to convince people that the data-life is the better life. Why be encumbered with materiality? Simply slip into an alternate, digital, immaterial reality. Alternate reality may become the next contender to heaven and hell.

It is tempting to dismiss a world like Matrix, Ready Player One, or Wreck it Ralph—but there are millions of people who long for and are

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mission-on-mars-comes-to-end [accessed February 18, 2019). The Curiosity Rover was still active on Mars along with the stationary InSight Lander when this article was written (Jonathan O'Callaghan, "This Was the Last Photo Taken by Nasa's Opportunity Rover on Mars," Forbes, Feb 18, 2019, https://www.forbes.com/sites/jonathanocallaghan/2019/02/18/this-was-the-last-photo-taken-by-nasas-opportunity-rover-on-mars/#367fab295a9a [accessed February 18, 2019).

[40] Two articles that explored potential ways of colonizing Mars: M. Z. Naser, "Space-native construction materials for earth-independent and sustainable infrastructure," *Acta Astronautica 155* [February 2019]: 264-273; Jiateng Long, "Mars atmospheric entry guidance for optimal terminal altitude," *Acta Astronautica 155* [February 2019]: 274-286.

[41] Nick Bostrom, Chapter 2, "Are You in a Computer Simulation" in *Science Fiction and Philosophy*, 22-25; David J. Chalmers, Chapter 16, "The Singularity: A Philosophical Analysis" in *Science Fiction and Philosophy*, 201-204; Kurzweil, *The Singularity Is Near*, 198-201; Shanahan, *The Technological Singularity,* 196-203; Jeanine Thweatt-Bates, *Cyborg Selves: A Theological Anthropology of the Posthuman* (Burlington: Ashgate, 2012), loc. 1774-2846.

[42] Chris Skinner, *Digital Human*, 27.

[43] Oculus.com/go (accessed February 18, 2019).

excited about alternate reality.[44] So much so that advocates for the singularity contend against those who follow more traditional theistic beliefs like those of the Jews, Muslims, and Christians.

Questions that pastor-scholars might reflect upon regarding alternate reality include: How does the idea of living a disembodied alternate reality affect an understanding of the body-soul composite, which is assumed from a traditional theological anthropology? If a conscious mind can be uploaded to an alternate reality, could a person evade bodily death by moving from one shell to another? Is alternate reality heaven or hell? How does this "eschatological future" contend against alternate futures anticipated by biblical eschatology? How does achieving an environment of alternate reality affect interpretations of apocalyptic literature in the Bible? What is lost by not experiencing death? Is the heroism related to Ernest Becker's "terror of death" lost? Is the inexperience of death something God wished for humanity?[45]

## BECOMING DATA, REMAINING HUMAN

Tech and biomedical leaders and companies fund research in human enhancement for a number of different applications. Some applications make life easier. Other applications seek to extend life indefinitely. Some enhancements are medical and biological. Other enhancements are technological. Integrating the two is also possible.

Transhumanists are concerned with the ethical implications of their work. Thus, they have setup some foundational presuppositions about humanity to safeguard it and ethically affirm its progress.[46] The first presupposition is grounded in evolutionary theory. Humanity was the product of its environment and ascended to its height as a result of its intelligence. Humanity manipulated its environment and controlled it and demonstrated its capacity to adapt to that environment. Because of its intelligence, humanity has the potential to adapt itself and guide itself through the next stage of evolution. In order to do so, humanity must come to terms with its own mechanics.

This leads to the second presupposition, which concerns the nature of humanity. Humans, organic as they are today, are manipulable, serviceable,

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[44] Organizations and societies that advocate for this kind of life include: Humanity+, Singularity University, Foresight Institute, Mormon Transhumanist Association, Christian Transhumanist Association, Alcor Life Extension Foundation, London Futurists, Institute for Ethics, and Emerging Technologies, and SENS Research Foundation.

[45] It seems to me that death is an essential experience of humanity. If not, the Son of God would not have had to endure death.

[46] See "Transhumanist Declaration (2012)" in *The Transhumanist Reader: Classic and Contemporary Essays on the Science, Technology, and Philosophy of the Human Future*, ed. by Max More and Natasha Vita-More (West Sussex: Wiley-Blackwell, 2013), 54-55.

and upgradable machines.[47] Humans can be enhanced, given enough raw resources and the capital to fund these enhancements. Enhancements prevent problems, augment advantages, or enhance features (e.g., eye color, hair color, skin tone). Individuals might go so far as to blend animal, mythical, and human features (e.g., cat eyes/ears, elf ears).[48]

What this means is that future humans may have the option to be other than (*hetero-*) or more than (*supra-*) human. Martin Rees projected this in 2003:

> These projections assume that our descendants remain distinctively "human." But human character and physique will soon themselves be malleable. Implants in our brain (and perhaps new drugs as well) could vastly enhance some aspects of human intellectual powers: our logical or mathematical skills, and perhaps even our creativity.[49]

More recently, Yuval Noah Harari in *Homo Deus* heralded similar expectations about humanity's future. Harari pointed out the striking inevitability of circumstances. In a world of global competition, Americans must enhance their children biologically with gene editing, given the medical technology to do so. There is nothing stopping a Russian, Chinese, or North Korean parent or government official from doing the same thing. Global competition demands Americans to participate in producing the best competitive athletes for the Olympics or the most efficient and effective soldiers on the battlefield.[50] As Doug Estes indicated, this kind of posture towards gene editing and human enhancement is a pragmatic response to the problem.[51] It may not be pragmatic in the normal sense of, "We can do something, so we should." Rather it is pragmatic in the sense that,

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[47] The Enlightenment figure Julien Offray de la Mettrie in his *Man a Machine* (1747) may be the earliest figure to propose the mechanistic nature of humanity (Julien Offray de la Mettrie, *Man a Machine and Man a Plant* (Cambridge: Hackett, reprint 1994). Kurzweil proffered that humans are spiritual machines, and he predicted that through technology humanity will achieve the ability to manipulate neural pathways. "With the understanding of our mental processes will come the opportunity to capture our intellectual, emotional, and spiritual experiences, to call them up at will, and to enhance them" (Kurzweil, *The Age of Spiritual Machines*, loc. 3174).

[48] See Laura Beloff, "The Hybronaut Affair" in *The Transhumanisty Reader*, 83-90 and Jacob Shatzer's related discussion in *Transhumanism and the Image of God*, 55-89. For another Christian distillation of enhancement see, Stephen Garner, "The Hopeful Cyborg" *Transhumanism and Transcendence: Christian Hope in an Age of Technological Enhancement*, ed. by Ronald Cole-Turner (Washington, DC: Georgetown University Press, 2011), 87-100.

[49] Rees, *Our Final Hour,* 18.

[50] "And if the government forbids all citizens from engineering their babies, what if North Koreans are doing it and producing amazing geniuses, artists and athletes that far outperform ours? And like that, in baby steps, we are on our way to a genetic child catalogue" (Harari, *Homo Deus*, 55).

[51] Estes, *Braving the Future*, loc. 942-43.

"Since someone else is doing it, we must likewise act." This is the expedient response and the pragmatic version of "might makes right."

People will make all sorts of very good arguments in favor of human enhancements such as gene editing. Some will include the opportunity to reduce disease and defects. Other arguments will include prolonging human life or allowing humans to accomplish the impossible. Perhaps humans will deep-sea dive without equipment. Maybe they will travel great distances in space without experiencing the trauma that interplanetary space travel induces.[52] Perhaps heart disease or Alzheimer's will be cured by a nip to the genetic code. These are the better reasons to enhance human life.

In spite of these exciting advantages and opportunities, it is vital to curb enthusiasm for human enhancement with a few sobering threats. Christian Posthumanist Jeanine Thweatt-Bates commented:

> Technological advances make promises of better health, elimination of genetically heritable disease, longer lifespans, and perhaps even enhanced capabilities, *but at the same time can also represent an invasion of bodily integrity, as well as economic and political exploitation and oppression*.[53]

Human enhancement will have consequences and forever alter global political and economic policies. It may take decades to clarify these policies, reassessing them for injustices. For instance, shouldn't everyone be entitled to enhancement, if indeed it could prolong life? Is there not some sort of equal opportunity legislation to be expected?

Weightier questions include: Will this change what it means to be human? Does the essence of humanity become altered in these processes, especially if scientists integrate technology and medicine to accomplish these aims? Once this is done, are they tinkering with the conventional understanding of anthropology? Could it be that what was once *anthropos* (man) then becomes *anthro-tekné* (man-tech)? This all raises the question of human nature's immutability? These are important questions for pastor-theologians to consider.

If all this speculation is reduced to an ultimate aim, it leads to the final objective of eluding death. The efforts of Transhumanists can be reduced to what Ernest Becker calls heroism in the face of humanity's greatest fear, for "of all things that move man, one of the principal ones is his

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[52] Shanahan proposed that unenhanced humans would not be able to colonize the galaxy because of their feeble and vulnerable nature. On the other hand, AI might accomplish this purpose. He commented: "Unhampered by earthly biological needs, capable of withstanding extremes of temperature and doses of radiation that would be fatal to humans, and psychologically untroubled by the prospect of thousands of years traveling through interstellar space, self-reproducing superintelligent machines would be in a good position to colonize the galaxy. From a large enough perspective, it might be seen as human destiny to facilitate this future, even though (unenhanced) humans themselves are physically and intellectually too feeble to participate in it" (*The Technological Singularity*, 157).

[53] Jeanine Thweatt-Bates, *Cyborg Selves*, loc. 133 (emphasis added).

terror of death."[54] This response to "terror" is the fundamental impulse of self-preservation, which drive advances in technology. The problem with this is that if preventive measures are not properly put into play, then AI and human enhancement could be the undoing of humanity rather than the salvation of humanity.[55]

Ethicists like John Harris have waged the argument that human enhancement is a moral obligation.[56] He dismissed objections with methodical precision. He dismissed the "Precautionary Principle" that risk outweighs reward. Rather, there is a responsibility to protect the human gene pool and not relegate it to the invisible hand of evolution. The responsibility to handle the integrity of the human genome is humanity's burden to bear. Harris argued that the outcome of letting evolution continue unguided is uncertain. A more favorable outcome comes from guiding the process. He dismissed the objection of "Playing God" because it is built on fallacious superstition, which is clearly a naive presupposition from which humanity should have already recovered. He demonstrated that much of human progress has occurred through human intervention of natural processes (e.g., pasteurization, immunization, antibiotics, et al).

As Harris concluded his argument for the moral necessity of human enhancement he contended:

> The overwhelming moral imperative for both therapy and enhancement is to prevent harm and confer benefit. Bathed in that moral light, it is unimportant whether the protection or benefit conferred is classified as enhancement or improvement, protection, or therapy.[57]

The reward over risk argument will win the day when it comes to human enhancement. This puts Christians in a precarious position. What does a Christian do when public policy permits, and everyone else participates in, genetic preventive measures? For instance, what might a Christian do with the scenario of giving birth to a Down Syndrome child? Are they morally obligated to participate in gene editing because societal pressure says that Down Syndrome is a defect and should be prevented? Rather, Christians ought to argue that the condition of a child being Down Syndrome falls under the watch of a kind, merciful, and providential Creator.

However, how do Christians properly engage in this sort of conversation with technologists, transhumanists, and biomedical professionals? How

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[54] Ernest Becker, *The Denial of Death* (New York: Free Press, 1973), 11.

[55] Fortunately, there is an ongoing conversation for philosophers and ethicists who anticipate these scenarios. See Bostrom, *Superintelligence*, 115-144; Eliezer Yudkowsky, Chapter 15, "Artificial Intelligence as a positive and negative factor in global risk" in *Global Catastrophic Risk,* ed. by Nick Bostrom, 308-345; Ali Nouri and Christopher F. Chyb, Chapter20, "Biotechnology and biosecurity" in *Global Catastrophic Risk*, 450-480; Julian Savulescu and Nick Bostrom, eds, *Human Enhancement* (New York: Oxford University Press, 2009).

[56] John Harris, Chapter 6, "Enhancements are a moral obligation" in *Human Enhancement*, ed. by Julian Savulescu and Nick Bostrom, 131-135.

[57] John Harris, "Enhancements are a moral obligation" in *Human Enhancement*, 154.

do they engage public policy makers on these issues? They cannot do so on the authority of the Bible alone, or if they do, they must first convince these people that the Bible stands as a reliable source of authority. The turn to dataism and the general dismissal of biblical authority compels Christians to engage this discussion on the grounds of natural law rather than on biblical law, which will be a hefty task to undertake. After all, not many Christians are cognizant with these technological advances and how they impact the Christian worldview.

## CONCLUSION

Possibly many readers of this essay will respond with incredulity. After all, doesn't technology always plateau? Yes, technology may be gauged as a series of exponential S curves rather than a single exponential explosion.[58] Yet, it seems that every time technology reaches a glass ceiling, it breaks through it. It somehow explodes to new heights. Whether the explanation for this is divine providence or human progress through human evolution—the intellectual, communicative, collaborative potential of humanity has not restricted the bounds of what might be accomplished. There is no substantive evidence or reason from the past that gives cause to conclude that humanity will not achieve its future goals in respect to AI, environments, and enhancement. Furthermore, humanity will use data science and machine learning to justify these objectives.

Theologian James K. A. Smith has gone to great lengths to help the church reflect on what it means to "imagine the kingdom." However, what if the majority of the non-Christian world has a very different vision and imagination for the kingdom, one that takes the evolutionary agenda to its guided potential? The incredulous will conjecture, "Surely man will not fabricate his own way to defeat death? After all, the death of death is what Christ accomplished as he emerged from the tomb." Yet, scientists in the twenty-first century wish to accomplish this feat. Perhaps apprehension drives incredulity. Perhaps temptation drives anxiety. Faced with the choice of embracing a Christian view of life and death or the guarantee that integrated biotech could deliver humans from this dilemma of death, what might many choose? Pastors and scholars should anticipate these challenges to their worldview and engage in the conversation now rather than wait until what is potential becomes actual.

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[58] "If we zoom in on this larger curve, we find that each distinct computing paradigm from mechanical switches to large-scale integration, follows a pattern of initial slow growth while the technology is in its infancy, followed by rapid (exponential) growth, ending with a plateau when the technology reaches its fullest potential. The overall exponential, in other words, is made up of a series of smaller S-Curves, one which corresponds to Moore's law. The laws of physics ensure that the larger exponential trend will also reach a plateau eventually, and reveal itself to be just another big S-curve" (Shanahan, *The Technological Singularity*, 160); also see Domingo, *The Master Algorithm*, 287; Kurzweil contended that we will see unforeseen exponential advances in the twenty-first century (*The Age of Spiritual Machines*, loc. 296).

If Transhumanists achieve their lofty ambitions during the twenty-first century, their discoveries will challenge the philosophical and theological worldview of Christians. Pastor-theologians should not be caught unaware but should be prepared to respond to objections these discoveries bring to Christian doctrines. C. S. Lewis's sage advice in his essay "Religion and Rocketry" is both noteworthy and comforting for those living in a time of uncertainty:

> This is a warning of what we may expect if we ever do discover animal life (vegetable does not matter) on another planet. Each new discovery, even every new theory, is held at first to have the most wide-reaching theological and philosophical consequences. It is seized by unbelievers as the basis for a new attack on Christianity; it is often, and more embarrassingly, seized by injudicious believers as the basis for a new defence. But usually, when the popular hubbub has subsided and the novelty has been chewed over by real theologians, real scientists, and real philosophers, both sides find themselves pretty much where they were before. So it was with Copernican astronomy, with Darwinism, with Biblical Criticism, with the new psychology. So, I cannot help expecting, it will be with the discovery of 'life on other planets'.[59]

[59] Lewis, *The World's Last Night and Other Essays*, 87.