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Automation and Apocalypse: Imagining the Future of Work

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INTRODUCTION

Klaus Schwab, founder of the World Economic Forum, claims we are living through "a revolution that is fundamentally changing the way we live, work, and relate to one another." Schwab labels this the "fourth industrial revolution," which is driven by transformative digital technologies.[1] The philosopher Luciano Floridi also argues we are living through a fourth modern revolution, an "information revolution," in which our dependence on automated information processing is "affecting our sense of self, how we relate to each other, and how we shape and interact with our world."[2] Artificial intelligence is at the center of these revolutions, and as these self-learning technologies have become more powerful and pervasive over the last ten years they have prompted a number of questions about the future of work. How much work currently performed by humans can be automated? How much of the workforce will be disrupted? How do we educate for future forms of work? What would happen in a world without enough work? As

1. Schwab, *Fourth Industrial Revolution*, 1.
2. Floridi, *Fourth Revolution* vi, 6.

important as these technological, socioeconomic, educational, and political questions are, there is a philosophical question that precedes and transcends these: What it the meaning of human work?

While automation is not new, AI is, as Pedro Domingos says, "something new under the sun."[3] John Markoff, who makes an important distinction between artificial and augmented intelligence—i.e., between independent human-like AI and AI (and other) technologies with which we partner—concludes that AI "will destroy a vast number of jobs" and at the same time enhance humanity.[4] As we consider the impact of new technologies on the future of work, it is important to remember that technologies have always been transforming the nature of human work. From simple stone tools to computer algorithms that improve automatically, technology has always been part of human work—enabling us to survive as well as thrive. And as we think about how technology and work together transform us, it is helpful to recall wisdom from the past, including theological wisdom, which can help us understand the nature and significance of work. From the garden of Eden to the garden-city New Jerusalem, the biblical narrative presents human work as an integral part of creation and our role within it.

The present age of automation requires us to imagine how AI, as something new, will shape the future of work. Fictional as well as non-fictional narratives about AI tend toward dystopian or utopian extremes, imagining that AI will destroy or save us.[5] Muriel Clauson points out that speculations about the future of work also include such extremes, ranging from "a potentially dystopian world of meager labor opportunities and robot overlords to a utopian world with work that is meaningful and a contributor to happiness."[6] Some utopian narratives go even further, imagining a world in which jobs will be irrelevant due to "radical abundance."[7] In dystopic futures, the relationship between technology and work is often oppressive. In utopic futures, this relationship is typically liberative. To these two dominant modes of thinking about the future, a third can be added: the apocalyptic. While the term apocalyptic is often reduced to something akin to dystopic, focusing on visions of cataclysmic chaos, in its historical and biblical origins the apocalyptic imagination is a theological interpretation

3. Domingos, *Master Algorithm*, xiv.

4. Markoff, *Machines of Loving Grace*, xii, xv, 327.

5. The Royal Society, "Portrayals and Perceptions of AI and Why They Matter," 4.

6. Muriel Clauson, "Future of Work," in Hoffman et al., *Cambridge Handbook of the Changing Nature of Work*, 555.

7. Kurzweil quoted in Ford, *Architects of Intelligence*, 246.

of reality that opens up deeper dimensions of knowledge, space, time, and agency to reveal a narrative about a new and better world.[8] In an apocalyptic vision of the future, it is possible to envision a relationship between automation and work that is more hopeful and transformative than many dystopian and utopian visions.

This chapter provides an orientation to the history of technology, work, and the theology of work and then explores three visions of the future of work—a literary dystopia, a philosophical utopia, and a theological apocalypse—as resources for understanding the significance of work and imagining its future. In the first vision, found in Kurt Vonnegut's speculative novel *Player Piano*, automation leads to the end of meaningful work and nearly renders humans obsolete. This dystopic vision reveals the value of human work but remains skeptical about our ability to preserve it against the advances of automation. The second vision comes from John Danaher's *Automation and Utopia*, which is a philosophical argument for the end of work through automation and for the creation of a utopia in which humans find meaning in a post-work world. This utopian vision reveals what is lost in a world without work and imagines what might be substituted for it. The third vision, from the end of the apocalyptic book of Revelation, considers how work and automation may participate in the transformation of the world. The chapter closes with a consideration of how this apocalyptic vision can inform our present and emerging world of human and automated work.

A BRIEF HISTORY OF TECHNOLOGY AND WORK

In the most basic sense, work is an activity that is a means to an end. The word is typically used to describe specific activities performed for some benefit—survival, economic gain, individual fulfillment, spiritual growth, or familial or social wellbeing. In Genesis, the first human is placed in the garden of Eden "to work [or till] and keep it," and the same Hebrew and Greek words are used to describe Cain's occupation as "a worker [or tiller] of the ground."[9] In addition to the instrumental or functional nature of work,

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8. Collins, "What is Apocalyptic Literature," in Collins, *Oxford Handbook of Apocalyptic Literature*, 2–3.

9. Gen 2:15 and 4:2, translations mine. In Hebrew, the word for work, *avodah*, is also used to describe worship and service to God: "Let my people go, so that they may worship me" (Exod 8:1); "serve the Lord your God with all your heart" (Deut 10:12). See Miller, foreword to Dorothy L. Sayers, *Why Work*, 13–14. The Greek word for work, *ergon* and its derivatives, are used to describe God's work of creation as well as spiritual activities: "God finished the work that he had done" (Gen 2:2); "I know your works—your love, faith, service, and patient endurance" (Rev 2:19, but compare more negative works in 3:1, 15).

Darrell Cosden highlights two additional dimensions. First, work has an existential or relational dimension: "a person finds, or contributes to who they are and will be (as well as what the world is and will be) in the process of working" with others. Work is a means of identity formation through a particular way of interacting with other people and the world. Second, Cosden emphasizes that work is not just a useful and relational activity: it is "a thing in itself with its own intrinsic value . . . built into the fabric of creation." Work in this sense exists or has its own ontology independent of us. Work provided the "starting point for a human rather than an animal existence" and became "a way of being which constitutes our humanness."[10] All three of these dimensions together—functional, relational, and ontological—give work a fundamental, intrinsic, independent, and enduring significance.

Over two million years ago, early hominins developed stone tools and techniques to access richer sources of calories and ascend the food chain. This lithic technology, which led to other physical, social, and cultural advances, "codirected human evolution" and eventually led "to the establishment of humans as the most successful tool users on the planet."[11] As Ron Cole-Turner points out, "Before we became humans, we made tools. And almost immediately, our tools began to make us more and more human."[12] Human technological development merged with natural evolution in such a way that, as John Durham Peters explains, the "question of how to define nature, humans, and [technology] are ultimately the same question. We know and use nature only though the artifacts we make—both out of nature and out of our own bodies—and these artifacts can enter into nature's own history."[13]

The emergence of *Homo sapiens*, beginning after two hundred thousand years ago and complete by sixty thousand years ago, was accompanied with an explosion of technologies for personal ornamentation, art, elaborate burials, complex multicomponent weaponry, long-distance trade, time-keeping, and scheduling.[14] Following the agricultural revolution some twelve thousand years ago, humans developed complex artificial environments—cities—as well as political, economic, and religious institutions to organize and sustain civic activities such as governance, trade, and cultural narratives.[15] Humans have been living in cities for nearly ten thousand years,

10. Cosden, *Theology of Work*, 12, 16–18.

11. Plummer and Finestone, *Rethinking Human Evolution*, 267–8; Biro et al., "Tool Use as Adaptation," 5.

12. Cole-Turner, *End of Adam and Eve*, 54.

13. Peters, *Marvelous Clouds*, 51.

14. Coolidge and Wynn, *Rise of Homo Sapiens*, 5–6.

15. Harari, *Sapiens*, 77–97.

writing and computing for some five thousand years, building machines for over two thousand years, and computing with machines for about three hundred years. Within the last few hundred years, modern advances in science and technology have driven Schwab's four industrial revolutions: steam power, electricity, digital computing, and a "second machine age" of more sophisticated, integrated, and transformative digital technologies.[16] Our increasingly complex stack of technology and the work it enables and creates seems to be limited only by our imagination.

Every major technological innovation changes what and how work is performed and creates the conditions for new types of work. The impact of transformative digital technologies such as big data, cloud computing, AI, and the Internet of Things—often called "exponential technologies" because of their association with rapid, profound, and systemic change—are expected to accelerate the digital transformation of our lives and the automation of work.[17] Instead of the centuries it took to shift from predominately agricultural to industrial societies, or the decades it has taken to shift from an industrial to an information society, the present digital transformation driving the accelerated automation of work is happening on a scale of years. With the social and economic disruptions caused by the COVID-19 pandemic, those years may have become months.

Steven McMullen claims that, "as a whole we are net beneficiaries of technology." Many will suffer employment losses, which along with inequitable economic and social impacts are significant matters of social justice. Looking toward the future, McMullen points out that both optimists and pessimists see something similar: less work. "But their description of the future looks radically different," he adds: "Optimists tend to imagine a future in which the gains from technological advances are widely shared, so that even those with little to offer in the labor market will still live a rich life of leisure. Pessimists, on the other hand, imagine a world in which a small segment of the workforce reaps most of the gains from technological advancement and others are left in poverty." Both views are problematic, though, for each fails to acknowledge that "humans find their highest end in creative service to those around them. Work . . . is best envisioned as a vocation that is worth a significant investment."[18] How, then, do we understand this creative call and compulsion?

16. Schwab, *Fourth Industrial Revolution*, 7.

17. Muriel Clauson, "Future of Work," in Hoffman et al., *Cambridge Handbook of the Changing Nature of Work*, 556; Siebel, *Digital Transformation*, 9.

18. McMullen, "Impossibility and Challenge of a World without Work," 5, 7.

A BRIEF HISTORY OF THEOLOGY AND WORK

According to Cosden, work is "built by God into the very structures of human nature and as a result, the natural order."[19] God's work of creation includes human work, and throughout the biblical narrative work is a significant focus of divine and human agency. From the beginning, humans have been asking questions about how God is at work and about the human vocation within creation. As work became more technologically sophisticated, so, too, did theological reflections about it. By the twelfth century, Hugh of St. Victor was able to incorporate technology into his theology of work in a way that remains helpful today.

Hugh distinguishes three major forms of creative work. First is the work of God in forming the world out of nothing, which establishes the subsequent work of nature. Next is the work of humans, which adds to nature: It is "the work of the artificer . . . to put together things disjoined or to disjoin those put together." But this work is corruptible and can deform relationships with God, nature, other humans, human creations, and our own selves. Third is the work of Christ, which includes his life, the scriptures and sacraments, and the communities that represent Christ. The work of Christ, mediated through embodied, textual, and ecclesial forms, takes up and transforms all work into new creation.[20] For Hugh, technology—divided into "fabric making, armament, commerce, agriculture, hunting, medicine, and theatrics"—has a central role in reforming our relationship with God and nature.[21] It is "part of the human quest for wisdom"; it extends our abilities and understanding; and, when used wisely, it can reform what has been deformed. Technology may be understood as part of Christ's work of new creation, reconciling divine, natural, and human artificial creativity.[22]

Paralleling the technological transformation of work during the first and second industrial revolutions, in the late nineteenth and early twentieth centuries more focused efforts emerged to integrate theology and work. David Miller sees in these efforts the "beginnings of the enlargement of the sense of Christian vocation" connected with visions of the future. Miller identifies two eschatological orientations. *Postmillennialism*, which tends to emphasize work done to bring about the kingdom of God, focuses on continual improvement and saving society. *Premillennialism*, alternatively, emphasizes the disruptive nature of God's eschatological establishment of

19. Cosden, *Theology of Work*, 18.

20. Hugh of St. Victor, *Didascalicon* 55; Illich, *In the Vineyard of the Text*, 124; Coolman, *Theology of Hugh of St. Victor*, 170.

21. Hugh of St. Victor, *Didascalicon* 74.

22. Allen, *Spiritual Theology*, 119.

the kingdom of God and tends to focus on saving individuals.[23] A third a-millennial eschatological orientation could be added, which includes Christians such a Dorothy L. Sayers and Charles Williams. Sayers speaks about work as "a *natural* exercise and function" of humanity, "the thing one lives to do" in service to God, and "the medium of divine creation."[24] While Sayers, an author and (former) copywriter, grounds her view of work in the doctrine of creation, Williams, an author and a publisher, envisions work as participation in new creation.[25]

Near the end of the twentieth century, as the third industrial revolution was laying the foundations for the fourth, Miroslav Volf called for a shift from developing an understanding of work within the framework of the doctrine of creation to one developed within the framework of new creation, which expects continuity but also radical change. This approach looks beyond postmillennial optimism about "the permanence of human moral progress" or premillennial subordination of work to one's "vertical relation to God" and seeks an "eschatological realism" that can "lead the present world of work 'towards the promised and the hoped-for transformation.'" The shift Volf recommends opens up eschatology as a resource for thinking about the future of work. According to Volf, "The eschatological transformation of the world gives human work special significance since it bestows independent value on the results of work as 'building materials' of the glorified world."[26]

THE FUTURE OF WORK

A recent report from the Royal Society on AI narratives points out that, "Narratives are essential to the development of science and people's engagement with new knowledge and new applications."[27] Stories form us and, consequently, our world. Whether we recognize it or not, individually and collectively we inherit and tell stories that expand or inhibit our imagination and agency. The future of work will be shaped by narratives that have shaped us and by the narratives we create. It is, therefore, important to explore and critique these narratives, especially those that tend toward dystopian and utopian futures. Jilles Smids, Sven Nyholm, and Hannah Berkers identify

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23. Miller, *God at Work*, 24, 36.

24. Sayers, *Why Work?*, 18, 21.

25. See Paulus, "Charles Williams's Theology of Publishing," 57–70; "From the City to the Cloud," 4–21.

26. Volf, *Work in the Spirit*, ix, 83–84, 90 (quoting Jürgen Moltmann), 96.

27. The Royal Society, "Portrayals and Perceptions of AI and Why They Matter," 4.

five common characteristics of meaningful work: (1) pursuing a purpose, (2) social relationships, (3) exercising skills and self-development, (4) self-esteem and recognition, and (5) autonomy.[28] These characteristics provide a helpful framework for interpreting exemplary dystopic and utopic visions, to see what insights and questions they reveal about the meaning of work.

Automation and Dystopia

Kurt Vonnegut's first novel, *Player Piano*, is an early AI narrative that could have been subtitled "automation and dystopia." Published in 1952, three years before the term artificial intelligence was coined for the Dartmouth Conference on Artificial Intelligence, *Player Piano* imagines a world in which machines outperform and displace human work. The world of the novel is supposed to be a utopia, a world of peace and prosperity: "Machines were doing America's work far better than Americans had ever done it. There were better goods for more people at less cost, and who could deny that that was magnificent and gratifying?"[29] Society is divided into two groups. There is an elite, wealthy group made of up those whose work has not been automated yet; male managers, engineers, and scientists and their wives are at the top this order. Other men are part of a work creation program called the Reconstruction and Reclamation Corps (the "Reeks and Wrecks") or in the military, and most other women seem to stay at home, supervising automated domestic work and children watching television.

Vonnegut's "ambiguous technological dystopia" was inspired by his work as a publicist for General Electric's Research Laboratory, where he became familiar with the latest technological advances and—for a brief unhappy period—had a role in promoting them with slogans such as "Progress Is Our Most Important Product."[30] What Vonnegut imagines, with the generation-old tubes and tapes analogue machinery of his time, is how existing technologies could be combined in a new way. If the industrial revolutions of steam and electricity "devalued muscle work," the next revolutions of automated and autonomous information processing would devalue "routine mental work" and, then, "human thinking"; "thinking machines" would end up doing "the real brainwork."[31] The modern history of technology that Von-

28. Smids et al., "Robots in the Workplace," 507.

29. Vonnegut, *Player Piano*, 56.

30. Klinkowitz, *Kurt Vonnegut's America*, 17.

31. Vonnegut, *Player Piano*, 21–22. Vonnegut refers to Norbert Wiener, who published *Cybernetics* in 1948 and *The Human Use of Human Beings: Cybernetics and Society* in 1950. *The Human Use of Human Beings* was a more accessible version of

negut narrates begins with humans creating and controlling technology, but this results in technology controlling technology and then humans. *Player Piano* asks if this is the end of the historical narrative.

From the beginning of *Player Piano*, it is clear that the fourth industrial revolution is not off to a promising start. The central figure of the book, Doctor Paul Proteus, who has the most prestigious job in his community managing the operations of machines, is not as enthusiastic about the system as he is expected to be. "Objectively," he tells himself while touring the machine city under his care, "things really were better than ever . . . know-how and world law were getting their long-awaited chance to turn earth into an altogether pleasant and convenient place in which to sweat out Judgment Day." Subjectively, he acknowledges that "his job, the system, and organizational politics had left him variously annoyed, bored, or queasy."[32] Proteus, like everyone else, is just part of a machine—an automatic part, not an autonomous participant in the system. The material benefits technology has given both the elites and the masses are not a substitute for what technology has taken away. This is what the player piano signifies: its automatic keys entertain but eerily recall the ghost that taught the machine to play—the person, machine logic concludes, who is no longer needed to create but only to consume.

As existential discontentment mounts among a diverse range of characters, a human counterrevolution rises up against the computer revolution. The counterrevolutionaries challenge the "right of technology to increase in power and scope"—which has become an unquestionable "divine right"—and issue a call "to give the world back to the people." Humans should control technology, the leaders of the counterrevolution declare. The "effects of changes in technology and organization on life patterns [should] be taken into careful consideration," they demand, and those "changes [should] be withheld or introduced on the basis of this consideration." Most importantly, it must be recognized that humans, "by their nature, seemingly cannot be happy unless engaged in enterprises that make them feel useful. They must, therefore, be returned to participation in such enterprises."[33] Humans, in short, need work—meaningful work (as defined by Smids et al.) that has a purpose, forms relationships, leads to self-development, contributes to self-esteem, and allows for autonomy.

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Wiener's first book, and it popularized the idea of a second industrial revolution driven by computers.

32. Vonnegut, *Player Piano*, 14–15.

33. Vonnegut, *Player Piano*, 284–86.

One of the counterrevolution's leaders, the Reverend James J. Lasher, confesses that he had previously encouraged people to think of their lives independent of their work. But when their work was taken away from them, they found "that what's left is just about zero. A good bit short of enough, anyway." Vonnegut seems to be saying that faith without work is insufficient—people need a "sense of participation, the sense of being important . . . of being needed on earth."[34] This remains true in a highly technological society. After people have asserted their agency against the machines and indiscriminately destroyed those around them, a bright young teenager is presented on the penultimate page scavenging for parts for "a gadget that'd play drums like nothing you ever heard before."[35] When Proteus—who once found meaning and glory as an engineer—is on trial for being a saboteur, he says, "What distinguishes man from the rest of the animals is his ability to do artificial things . . . To his greater glory, I say. And a step backward, after making a wrong turn, is a step in the right direction."[36] Vonnegut is not rejecting a technological society; he is asking how we design one that includes meaningful work.[37]

Automation and Utopia

In *Automation and Utopia: Human Flourishing in a World without Work*, John Danaher answers a different question—because he starts with the claim that "human obsolescence is imminent." What we do, he argues, is increasingly less relevant "to our well-being and the fate of our planet." The Anthropocene is yielding to the Robocene, and soon "there will be little left for us to do except sit back and enjoy the ride."[38] If we do not want to end up sated and stupefied in a *WALL-E* post-work world, we need to imagine how humans will find the purpose, social relationships, self-development, self-esteem, and autonomy which will no longer be found in meaningful work.

Before presenting his solution, Danaher makes a case for the possibility of automating all forms of work. Automation will continue to advance further into agricultural, industrial, financial, legal, medical, governmental, scientific, and every other form of physical and affective labor. Although Danaher's focus is on work "performed in exchange for an economic reward," his view of automation is comprehensive and includes work related

34. Vonnegut, *Player Piano*, 94.
35. Vonnegut, *Player Piano*, 319.
36. Vonnegut, *Player Piano*, 295.
37. See Segal, *Future Imperfect*, 126–46.
38. Danaher, *Automation and Utopia*, 1–2.

to discovery, creativity, and care. Danaher argues that we should accept the end of economically incentivized work as a good thing and hate our jobs (even if we love them). The current reality of work for many is bad—precarious, inequitable, oppressive, and unsatisfying—and it is getting worse, he argues. Since the "structural badness" of work is very difficult to reform, Danaher concludes that we should embrace the economic liberation autonomous and intelligent technologies may provide.[39]

After presenting his arguments for automation and the end of work, Danaher rehabilitates the concept of utopianism to confront what he sees as the next significant human project: creating a world in which humans can thrive when they no longer need to work. Rather than a rigid plan (a "blueprint"), he defines utopia as a range of possibilities that are practical but also radical improvements (a "horizon"). He also develops a "utopian scorecard," which evaluates utopias against the problems of both automation—which can inhibit attention, agency, and autonomy—and of utopianism, such as violence and inertia. Using this evaluative framework, Danaher presents two possible worlds: a cyborg utopia and a virtual utopia.

In a cyborg utopia, we merge with technology to upgrade ourselves and maintain our cognitive evolutionary niche. Humans have been living into a cyborg utopia for some time—conceptually, extending our minds through artifacts, and technically, with medical implants. It is the conservative option, which gives it both strength and weakness. The cyborg utopia conserves what we value (our superior intellectual agency) as well as what we do not (e.g., social inequities). This utopia could therefore become a dystopia, and Danaher concludes it is not the utopia we are looking for.

The best possible world Danaher imagines is a virtual utopia, in which we retreat from our cognitive dominance of the world and cultivate crafts through games. "Virtual" is not reducible to life inside a computer-generated environment, and humans have been living in complex virtual or artificial environments such as societies and cities for many millennia. To these we have added digital simulations, which are still real in the impacts they have on us and others. What is radical in Danaher's proposal is what we will do in these physical and digital virtual environments. His virtual utopia is a utopia of games: we will play games that we understand, so there is no coercion; we will play for "trivial or relatively inconsequential stakes," because all the important work will be done by artificial agents; and we will cultivate abilities and virtues through the games we select and create.[40]

39. Danaher, *Automation and Utopia*, 28, 54.

40. Danaher, *Automation and Utopia*, 229.

Danaher's virtual utopia involves being severed from the world, surrendering human control as well as direct knowledge of and engagement with it. Danaher acknowledges the loss of instrumental impact in the world, and emphasizes the value of processes over end states—the satisfaction of "purely procedural goods" and "good work [done] for its own sake." The gains, he argues, outweigh the losses: human attention, agency, autonomy, and other important values will be preserved as people think, plan, decide, create, interact, and realize "ever higher degrees of achievement." Games, Danaher concludes, "could be enough to sustain meaning and flourishing" and "would represent a significant societal improvement."[41] But is this a substitute for all the goods associated with meaningful work as identified by Smids, Nyholm, and Berkers—i.e., pursuing a purpose, social relationships, exercising skills and self-development, self-esteem and recognition, and autonomy? Perhaps, to an extent. But if work is reduced to games in virtual environments, without a purposeful impact on the broader world, what might happen to our self-understanding and sense of fulfillment?

For Danaher and his virtual utopia, there is no ultimate end goal or *telos*—only "infinite possibilities." We are, he claims, like the denizens in Jorge Luis Borges's short story "The Library of Babel," searching for meaningful books in a universe full of mostly meaningless and misleading books. Their quest is futile, for their world is an antilibrary. "We shouldn't keep searching through the infinite darkness for something we ourselves can never obtain," Danaher concludes; "we shouldn't sacrifice everything else that is good in life for an unending, and unrealizable, goal."[42] If, however, our world is more like a library, presenting us with information about its *telos*—and if our encounter with that information can transform us toward its realization—then the means *and* ends of direct engagement with the world and our instrumental work within it matter significantly. For Christians, who believe creation mediates knowledge of God and that we have a vocation to be participants with God in new creation, living life as a mere game severed from the created world would be a dystopia—or, more precisely, a form of hell.

As these exemplary visions show, the distinctions between dystopias and utopias are hard to maintain. Ursula K. Le Guin points out that "every utopia since [Thomas More's 1516] Utopia has also been, clearly or obscurely, actually or possibly, in the author's or in the readers' judgment, both a good place and a bad one. Every eutopia contains a dystopia, every dystopia

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41. Danaher, *Automation and Utopia*, 236, 238–39, 245, 251.
42. Danaher, *Automation and Utopia*, 271, 273.

contains a eutopia."[43] Bad (*dus-*), good (*eu-*), and no (*ou-*) places (*-topoi*) can open up our imagination to possible futures of work, but Vonnegut and Danaher—along with many other literary and philosophical xtopian thinkers—run into the limits of the purely human imagination. Tom McLeish argues that theology opens up our imagination to something greater than natural or human creativity: it considers divine creativity and ultimate ends. "Because theology observes and construes stories," McLeish says, "it is able to discuss purposes and values—it can speak of, and ground, 'teleology.'" Theological narratives, McLeish concludes, can help us understand shared end goals as well as "shared experiences of creativity and constraints."[44] If we are asking questions of teleology, we are asking questions about final or ultimate things—i.e., eschatology, which Volf argues is an important resource for thinking about the future of work.

THE ESCHATOLOGY OF WORK

Michael Burdett argues that "Christian eschatology can provide a more robust account of the future than those offered by technological futurism." Futurism, which shapes most xtopian visions, considers the future "as an outworking of present conditions and forces so that the future is a product of what has preceded it. It is driven from behind." But there is an additional way of looking at the future—*adventus*—which "describes that which is coming." Instead of making claims about the future as a mere product of the past and present, it "speaks of arrival. It is driven by what is ahead." This alternate way of viewing the future, Burdett argues, can provide corrective counternarratives to those shaped by futurism: the "future does not just depend upon the present actuality but upon a robust account of possibility which does not define possibility according to the actual."[45]

For many Christians, eschatology is grounded in the last two affirmations of the Apostles' Creed: "the resurrection of the body, and the life everlasting." For the earliest Christians, who drew from Jewish apocalyptic images, concepts, and narratives about a new and better world, the resurrection of Jesus was an apocalyptic event that inaugurated a hoped-for transformation of the world. According to N. T. Wright, the Christian apocalyptic imagination "opens up a vision of new creation which precisely overlaps with, and radically transforms, the present creation."[46] Apocalyptic visions

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43. Le Guin, *No Time to Spare*, 85.

44. McLeish, *Faith and Wisdom in Science*, 214, 248.

45. Burdett, *Eschatology and the Technological Future* 2–3, 237.

46. Wright, *History and Eschatology*, 156.

often include cataclysmic events, associated with eradicating evil, but in popular usage an apocalypse is often reduced to something just cataclysmic. Ray Bradbury's short story "There Will Come Soft Rains" is an apocalypse of this variety: After a nuclear event, a smart home keeps operating to serve its annihilated masters until it, too, is destroyed by fire.

But the Christian apocalyptic vision, inspired by *adventus*, is an eschatological view that sees heaven meeting earth, the future in the present, and humans as divinely called transformative agents. This apocalyptic perspective uncovers and reveals the integrated and interlocking nature of seemingly disparate dimensions of reality. The function of apocalyptic literature, such as the book of Revelation, is to present a narrative that opens up our imagination to a new view of the world—a view that can help us apprehend the meaning of human work and a vision of its future.

Revelation, or the Apocalypse of John, is a book for and about cities. It is an epistle to seven historical cities (chapters 1–3), describing what was happening in their time and what is yet to come. John's unveiling of God's unseen transformative work culminates in the "great vision" of God's promised future—the *telos* of the biblical narrative and the Christian apocalyptic imagination—New Jerusalem.[47] This city, which comes down from the new heaven, is the central place of the new earth. The previously ambiguous product of human technological creativity is transformed into a holy but "historical and this-worldly" city, in which God dwells (or tabernacles, as in John 1:14) with humans and where there is no more sin, suffering, or death.[48]

The new city John sees, from and filled with the glory of God, possesses a material splendor trivializing any glory of which a human city could boast. New Jerusalem is an enormous cube, like the holy of holies in the temple, and its walls, gates, and foundations are perfectly planned and proportioned. Measuring some 1,500 miles on each side—twelve hundred times larger than the ancient city of Babylon, as it was measured by Herodotus—the city is made of and adorned with precious earthly materials.[49] The city has no temple nor natural or artificial light, for God's presence fills the whole city and Christ enlightens it. The city has been prepared for God's people, whose ancestors' names are inscribed upon its gates and foundations. The rulers of the earth and people from all nations, drawn to the city by the light of Christ, bring into it "the glory and the honor of the nations," including their material gifts and goods.[50] In this "new, improved, urban

47. Wright, *Surprised by Scripture*, 203.

48. Blount, *Revelation*, 327, 378, 380.

49. 144,000 stadia versus Babylon's 120. See Thomas, *Apocalypse*, 645.

50. Rev 21:26. On "glory and honor," see Aune, *Revelation 17–22*, 1173.

Eden," nature fills the city with beauty, life, and healing.[51] There is "perfect harmony between civilization and nature."[52] Divine, natural, and human work have not only been reconciled but given a new coinherent dynamism.

Brian Blount emphasizes the concrete realism of John's apocalyptic expectations: "Christ's coming," he observes, is connected "with a tangible, measurable, objective city." The metaphor of the city "signals a salvific identity that is neither individualized nor spiritualized but concretized in the communal relationship that exists in an urban environment."[53] The eschatological life envisioned in this urban environment includes diverse people and vocations, interdependent and collaborative relationships, and cultural activities and artifacts that constitute the dynamics of civic life. All of this, Richard Bauckham concludes, "fulfills humanity's desire to build out of nature a human place of human culture and community."[54]

Continuities between the new and initial creation, as well as future possibility and present actuality, have important implications for the present world. "John's vision," Blount observes, "redeems the earth as part of God's *good* creation and as the locus of God's grand re-creation." When God declares, "See, I am making all things new," "God is taking what is old and transforming it. . . . The old will remain a constituent part of the new." A witness of Christ, therefore, "works with God to transform the world" in the present.[55] Bruce Metzger points out that although God's statement about making all things new refers "primarily to the final renewing at the end, the present tense also suggests that God is continually making things new here and now."[56] Eugene Peterson points out the lack of escapism in the vision of New Jerusalem: "This is not a long (eternal) weekend away from the responsibilities of employment and citizenship, but the intensification and healing of them." We are already in Christ, Peterson adds, "part of and participant in the new creation, the holy city in which God is ruling and having his way." Images of New Jerusalem, Peterson concludes, "are a means for discovering the real in the tangle of illusion" and fraud that fills the cities in which we currently live.[57]

The fact that the ambiguous image of the city is not annihilated but rather amplified suggests that complex human artifacts—including artificial

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51. Blount, *Revelation*, 395; see Rev 22:1–2.

52. Jürgen Moltmann, quoted in Volf, *Theology of Work*, 173.

53. Blount, *Revelation*, 20, 378.

54. Bauckham, *Theology of the Book of Revelation*, 135.

55. Rev 21:5; Blount, *Revelation*, 376–77.

56. Metzger, *Breaking the Code*, 129.

57. Peterson, *Reversed Thunder*, 174, 183; cf. 2 Cor 5:17.

autonomous agents—can be transformed into a constitutive part of God's new creation. Human technological culture created the city, "a new ontological reality" that, when transformed by God, continues in the new creation.[58] Might this mean that technical trades and their technologies—an "essential feature" of both ancient and contemporary cities—have a place in New Jerusalem?[59] Cosden's theology of work, which argues that "work is so fundamental to creation and human existence that it is necessarily a part of both this life and the life to come," supports this possibility. "All *positive* transformative action," he argues, "may be considered to participate in . . . the fulfillment in the present of God's will on earth." Such human work transcends "both its results and its use to workers," and "our work and works . . . become entities which themselves, by flourishing as themselves," can glorify God.[60]

According to Cosden, the *telos* of the Apocalypse is also a new beginning. One can imagine new glorified forms of human work and works—human participation in new projects with God—as well as glorified rest. Not only will the restriction on work "as part of the temporal rhythmic work-rest cycle of the sabbath . . . pass away," but the "distinction between 'work,' 'rest,' and 'play' will disappear."[61] The presence and peace of God, previously mediated through the temple and sabbath, will permeate every activity in New Jerusalem. In this apocalyptic vision of a future of participating in transformed work and works, we can imagine the full realization of meaningful work as defined by Smids, Nyholm, and Berkers: The purpose of work is clear, relationships will flourish with a shared *telos*, and humans will realize new forms of internal and external glory and live in perfect freedom.

WORK+ NOW

The climax of the Apocalypse is the fall of Babylon, the penultimate city and an image of every human-made city. When John is shown Babylon, "the great city that rules over the rulers of the earth," he sees the economically exploitive and politically oppressive Roman Empire.[62] The fall of Rome, the

58. Cosden, *Theology of Work*, 173.

59. "The presence of various crafts was an essential feature of the ancient city. The crafts typically included metalworking, brick-making, glassmaking, carpentry, perfume-making, tent-making, spinning, weaving, tanning, dyeing, pottery-making, carving, sculpture, and stonemasonry." Aune, *Revelation 17–22*, 1009.

60. Cosden, *Theology of Work*, 175, 184.

61. Cosden, *Theology of Work*, 12, 162, 170.

62. Rev 17:8.

greatest city in the ancient world, was centuries away when the Apocalypse was written. But its fall—like the fall of the Babylonian Empire before it and every other empire since—is assured. The Apocalypse, therefore, creates "a remarkable space" for a broader critique of any imperial system that seduces rulers and followers with material comforts, that seeks its own power and prosperity at the expense of others', that suppresses opposition, that upholds its survival as the ultimate value, and that is doomed to fail for its denials of what truly sustains life.[63] As much as the reality of New Jerusalem is breaking into the present, we still live within the reality of Babylon.

The fall of Babylon is celebrated—for its violent injustices are condemned and come to an end. Babylon's fall is also lamented. The rulers, merchants, and sea traders who benefited from the excesses of empire lament their loss of power and prosperity. But there is also lament, voiced by a divine messenger, over the loss of cultural activities and artifacts that fill daily life: musicians playing instruments; artisans or artificers (*technites*) of every technical trade (*techne*) working with tools; millers grinding grain; and people lighting lamps and celebrating marriages.[64] Babylon both attracts and repels; it includes the glory and refuse of the world. In the vision of the final city, New Jerusalem, evil will be banished and the good work being done and the good works being created in Babylon will be preserved.

Before its fall, the Apocalypse reveals that another king—the ruler of rulers—and his kingdom already exist within Rome's.[65] New Jerusalem is descending and "the kingdom of the world has become the kingdom of our Lord and of his Christ."[66] In the epilogue of the Apocalypse, New Jerusalem says, "Come," and those who hear call out to the thirsty, "Come" and "take the water of life" flowing through the middle of the street of the city.[67] Those whom God has liberated and made "to be a kingdom" are also called to "come out" of Babylon.[68] Blount describes this as "a figurative separation" from the corruptions of Babylon to participate in the present reality of Christ's rule.[69] The form of this vocation, then and now, includes confronting the deformations of human culture through "active, non-violent, engaged resistance" and work that leads toward transformation.[70]

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63. Gorman, *Reading Revelation Responsibly*, 145–46.

64. Rev 18:22–23.

65. Rev 17:14.

66. Rev 3:2; 11:15; cf. 14:8.

67. Rev 22:17.

68. Rev 1:5; 18:4.

69. Blount, *Revelation*, 327.

70. Blount, *Can I Get a Witness?*, 46. Blount presents this interpretation of witness

According to Cosden, this present work—which participates in its future form—is instrumental, relational, and has its own ontology. Work is instrumental because it provides necessary resources for human flourishing and spiritual development, now and in the world to come. Work is relational because it forms our identities and relationships with others and the world. And work and its associated artifacts have intrinsic value—an ontological existence of their own. Together, these dimensions of human work encompass key qualities of meaningful work: human purpose, relationships, contributions, fulfilment, and freedom. These dimensions of work also point to its enduring significance for us and our world. Even though human work has become increasingly complicated throughout history, and its imprint on natural and human environments is both transformative and deformative, an apocalyptic view of work can open up our imagination to the potential for advanced technologies, such as autonomous agents, to participate with us not only in the ongoing transformation of work and the world but—as agents of new creation—in the transformed new world of work.

In the biblical narrative, God's creative agency links the beginning and the end—forming all things in the first words of Genesis and transforming all things in the final words of Revelation. If, as T. S. Eliot wrote apocalyptically, our end is not in our beginning but rather our beginning is in our end, the image of New Jerusalem can help us understand the *telos* of technology and work.[71] In the ultimate city, divine, human, and artificial agency are fulfilled together. We must, as Burdett cautions, be guarded against futurism—even theological futurism. Although our new works may find "their origin and connection to how God works in new ways," as we discover "pockets of God's promised future," "our planning must be contingent" because the fulfillment of God's promises "constantly evades" our expectations.[72] But, as Karen Lebacqz argues, in New Jerusalem the limits imposed on initial creation in the garden of Eden have been transcended: "although we should always remember our current fallen state and tendency toward hubris, we need not at root fear [technological] enhancements—it is our destiny to be more than we were at creation, to become friends with God and partners in the Holy City."[73] And we can live into this *telos* with automation.

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in Revelation "through the double lens of John's late-first-century, Asia Minor context and the historical context of the Black Church tradition" (*Can I Get a Witness?*, 46).

71. Eliot, *Four Quartets*, in *The Complete Poems and Plays*, 123, 129.

72. Burdett, *Eschatology and the Technological Future*, 242.

73. Lebacqz, "Dignity and Enhancement in the Holy City," in Cole-Turner, *Transhumanism and Transcendence*, 59.

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