Transhumanism

with Hava Tirosh-Samuelson, "Transhumanism as a Secularist Faith"; Robert M. Geraci, "Video Games and the Transhuman Inclination"; James J. Hughes, "The Politics of Transhumanism and the Techno-Millennial Imagination"; and Ronald Cole-Turner, "The Singularity and the Rapture: Transhumanist and Popular Christian Views of the Future"

THE SINGULARITY AND THE RAPTURE: TRANSHUMANIST AND POPULAR CHRISTIAN VIEWS OF THE FUTURE

by Ronald Cole-Turner

Abstract. Religious views of the future often include detailed expectations of profound changes to nature and humanity. Popular American evangelical Christianity, especially writers like Hal Lindsey, Rick Warren, or Rob Bell, offer extended accounts that provide insight into the views of the future held by many people. In the case of Lindsey, detailed descriptions of future events are provided, along with the claim that forecasted events will occur within a generation. These views are summarized and compared to the secular idea of a coming "intelligence explosion" or technological singularity as advanced by Ray Kurzweil, which is described in terms of its history as an idea and in terms of its specific proposals for the coming transformation of the cosmos, which is also predicted to occur within a generation. While profoundly different in important ways, these two perspectives share many features with each other—for example, in their respective predictions of distinct stages in the unfolding of the future of the cosmos.

Keywords: apocalyptic; intelligence explosion; Ray Kurzweil; Hal Lindsey; popular Christianity; singularity

---

Will the future be different from the present? Religious people, especially conservative Christians, usually think so. Religious views about the future are held by a substantial majority of Americans, at least according to recent polling data from the Gallup News Service. "Roughly 9 in 10 Americans believe in God or a universal spirit, while fewer than 10 percent are firm in

Ronald Cole-Turner holds the H. Parker Sharp Chair in Theology and Ethics at Pittsburgh Theological Seminary, 616 North Highland Avenue, Pittsburgh, PA 15206, USA; e-mail: coleturn@pts.edu.

[*Zygon*, vol. 47, no. 4 (December 2012)]
 ISSN 0591-2385 *www.zygonjournal.org*

their belief that there is no God. Eighty-one percent of Americans believe in heaven. At the same time, 7 in 10 profess belief in the Devil and in hell" (Gallup 2007). Religion, however, is not the only basis for thinking that the future will be significantly different from the present. Many futurists look forward to future transformations, basing their predictions not on religious texts but on expectations about impending advances in technology. New technologies are welcomed with enthusiasm by many people, and while not everyone agrees with the amount of transformation that lies ahead, nearly everyone expects profoundly significant technological advances for good or ill, including those who look forward to religious transformation as well.

What is meant by heaven and hell? Explanations are not found in the survey data, but one window into popular notions of heaven and hell may be found in popular Christian writings that both reflect and shape Protestant evangelical and fundamentalist thinking in the United States and beyond. In the wildly popular writings of Hal Lindsey and his co-author, Carole C. Carlson, or of best-selling authors like Rick Warren or Rob Bell, detailed futuristic scenarios are explained and, to some extent, debated. These views are summarized in the opening section of this paper.

The second section turns to the concept of a coming technological singularity, most often associated with the writings of Ray Kurzweil but shared widely among transhumanists and others who foresee the rise of superhuman intelligence. While these views are often neutral or even hostile to traditional religion, they are not void of themes that resonate with religious overtones. This resonance has not escaped attention elsewhere. Others have compared ancient religious and present-day secular views of the future, sometimes by focusing specifically on the notion of apocalypticism, a loose term that refers broadly to religious or mythological views that see the world as sharply divided between good and evil and between a new era and an old or dying age. At the beginning of the Common Era, such views were present in Judaism and then in early Christianity, whose founding figures all endorsed aspects of apocalyptic thinking.

Some have suggested that a remarkably similar apocalypticism is found among today's technologists, especially in fields like artificial intelligence. For example, Geraci (2010) explores the technological culture that surrounds artificial intelligence (AI), calling it "Apocalyptic AI." According to Geraci, "Apocalyptic AI is a technological faith that directly borrows its sacred worldview from apocalyptic Judaism and Christianity. Like these, it refers to (1) a dualistic view of the world, which is (2) aggravated by a sense of alienation that can be resolved only through (3) the establishment of a radically transcendent new world that abolishes the dualism and requires (4) radically purified bodies for its inhabitants. The apocalyptic worldview has deeply penetrated the technological worldview of modern life . . ." (36–7).

The focus here, however, is not on ancient but rather on contemporary religious apocalyptic views and how they compare with today's technological expectations of the future. This topic is explored in the "Comparative Apocalyptics" section, which compares and contrasts the popular religious writings of Lindsey, Warren, and Bell with the notion of the singularity and cosmic transformation as put forward by Kurzweil (2005). This comparison raises intriguing questions. How are we to explain the similarities? It might be argued, for example, that over the centuries religious views have created a culture that looks forward to a future that is profoundly different from the present, a culture of perpetual discontent and expectation. Or some might suggest that the advocates of technological transformation are not just inventing tools but also inventing a new religion, even a new god, one that comes into existence only at the end, once intelligence has surpassed human limits and transformed the cosmos. If so, the new religion must share at least some of the features with what it seeks to replace. For now, however, technology and faith exist side by side, shaping hopes, expectations, and fears of heavens and hells, whatever these terms may mean.

Recent Popular Christian Views of the Future

Three authors—Hal Lindsey, Rick Warren, and Rob Bell—are selected here as representatives of contemporary American Protestant Christian views of the future. One main reason for their selection is their popularity and impact in shaping the current views of American evangelical and fundamentalist Christians. The combined sales of these three writers may exceed 100 million. Warren's *Purpose Driven Life* probably holds the record as the fastest title in history to surpass 30 million in sales. Their impact on contemporary American evangelical Protestantism is pervasive, and so their views provide a useful window into the religious mindset of a significant portion of Americans, whose political preferences and whose attitudes toward science have implications for human beings everywhere.

Of the three, Lindsey (with his collaborator, C. C. Carlson) is most properly identified as a "fundamentalist." All three writers may be placed under the broader banner of evangelical Christianity. Typical of contemporary evangelicals, they regard the Bible, especially the Christian New Testament, as the primary source and exclusive authority for their views. They see themselves as largely free of any institutional control or traditional human authorities. Most of all, they see themselves as repudiating key themes in earlier Christian "liberal" theology, especially the tendency of nineteenth century Protestantism to endorse the general optimism of that era, including confidence in the inevitability of social and technological progress.

In Protestantism, theological optimism came to preeminence in the years just before World War I. For theologically sophisticated Christians of that era, hope for social progress in the coming century pushed aside nearly everything traditional Christianity said about the future, sometimes even including the expectation of personal immortality. In the century before 1920, both Protestant and Catholic academic theology largely ignored the topic of eschatology altogether, perhaps viewing the apocalyptic statements of Jesus as something of an embarrassment, more often denying he said them at all.

Views of the future held by Lindsey, Warren, and Bell have more in common with early Christianity than with nineteenth-century Protestant liberalism. Christian views of the future as radically different go back to the very beginning of Christianity and beyond, finding their origin in Jewish messianism and apocalypticism. At least around the time when Christians first emerged as a separate community, Jewish apocalyptic views held out the hope of divine intervention in human history, leading to a reinstatement of the Davidic dynasty in perpetuity. Christianity's claim that Jesus is the reinstatement of the messiah builds upon, but significantly modifies, messianism, introducing a sense in which this future has already arrived. Christianity maintains hope for a coming future that is radically different from the present, but also sees that future as having begun at least in one instance—that of the resurrection of Jesus Christ. In that event, the transformation of the cosmos has already begun. Because its belief about the future centered on the identity of Jesus Christ, Christian expectation has a twofold temporal dynamic that is not easily reconciled. Christ has come and will come again. He is present and absent, complete and yet not completed.

With the possible exception of the question of personal immortality, Christianity largely abandoned interest in the question of the future as radically different from the present, especially in the nineteenth century. A dramatic shift occurred in the context of World War I and specifically in 1918 with Karl Barth's much-quoted assertion that "a Christianity which is not wholly eschatology and nothing but eschatology has nothing to do with Christ" (314). Some academic Protestant theologians took up Barth's (1933) challenge, but as late as 1954, the great Catholic theologian Karl Rahner (1961) wrote: "We may consult any bibliography we like, and yet be horrified by the thinness . . . and lack of interest in Eschatology itself. Today we say that Heaven is a place and that no one knows where it is. Simple, but a little too convenient" (19). In the aftermath of World War II and with the proliferation of nuclear weapons, the question of the future became increasingly urgent for humanity and for theology.

As hope for social progress or technological salvation faded even more in the United States after World War II, popular American religion focused increasingly on individual believers and their salvation, setting the stage for

writers like Larsen, Warren, or Bell. Of the three, Lindsey offers the most detailed description of what he expects. He argues that ancient Hebrew and Christian scriptures provide a precise roadmap for future events. He notes the widespread interest in astrology but argues that the test for any type of prediction is its record of fulfillment. On this basis, he argues that ancient prophecies about Jesus are fulfilled in detail and therefore should be trusted when they predict future events not yet fulfilled. Then, drawing on Hebrew and Christian scriptures, Lindsey offers a detailed a forecast of the "end-times."

Israel and Jesus play a central role in his interpretation. Lindsey's argument is pro-Israel but not pro-Jewish. In his view, Jews misinterpreted their own texts. "In their blindness they discounted more than *300 specific predictions* in their own sacred writings about this Messiah. . . . They couldn't be bothered" (31). When it comes to Jesus, however, there is a problem text any Christian interpreter has to explain. According to sources as reliable as any, Jesus himself said (according to Lindsey and Carlson (1970)), "Truly I say to you, *this generation* will not pass away until all these things take place" (Matt. 24:34 NASB). He continues with the obvious question "What generation? Obviously, in context, the generation that would see the signs—chief among them the rebirth of Israel. . . . If this is a correct deduction, then within 40 years or so of 1948, all these things could take place" (54). He reviews events beginning with 1948 and concludes that from the vantage point of 1970, "current events are fitting together simultaneously into the precise pattern of predicted events. . . . It's happening. God is putting it all together" (80).

Looking ahead from 1970, Lindsey predicts that almost entirely without warning, the rapture or the taking up of those who "believe" in Christ will occur. "Someday, a day that only God knows, Jesus Christ is coming to take away all those who believe in Him. He is coming to meet all true believers in the air. Without benefit of science, space suits, or interplanetary rockets, there will be those who will be transported into a glorious place more beautiful, more awesome, than we can possibly comprehend" (137). When this happens, the believers will be changed. Lindsey explains: "'Changed' means to be changed in essence, but not to be completely changed in appearance." In other words, people will still recognize each other while changed radically. For Lindsey, writing to a somewhat anti-Catholic audience of conservative Protestants, this is a surprising echo of the medieval Catholic view of transubstantiation, according to which the bread of the mass is changed in substance or essence while unchanged in appearance. But if we do not like our appearance, Lindsey reassures us that the change on the inside will make us look better on the outside. "If you're not too satisfied with the face or body you now have, you will have a glorious new body." We will be able to eat, apparently without gaining weight: "For those who have a weight problem, that sounds rather heavenly

in itself. Our eternal bodies will not be subject to aging, or pain, or decay. Just think how excited a woman can get about a new wardrobe. How much more excited we should be about acquiring a new body!" (141).

Following the rapture is a seven-year period called the "Tribulation," a time of "remarkable progress" followed by great chaos. At the midpoint, the "Antichrist" who brings short-term peace and prosperity is revealed as pure evil. "The Antichrist declares himself to be God, . . . [and that] beautiful balance of power established by the Antichrist is suddenly ruptured, unleashing 'all-out war'" (153). Ancient prophecies of "fire and brimstone" raining from the skies are surely foretelling the use of nuclear weapons. The period of Tribulation ends for Lindsey when Christ returns to rule on earth to destroy all enemies and to usher in 1,000 years or a millennium of paradise restored. This is the next stage, the millennium that "will be characterized by peace and equity, and by universal spirituality and knowledge of the Lord. Even the animals and reptiles will lose their ferocity and no longer be carnivorous" (177).

In this restored paradise, however, some will rebel, and their rebellion will trigger the transition to the final stage. "Christ judges them, then He completely changes the old heaven and earth and creates a new one." This, at last, is "heaven" in the full and final sense of that word. What is "heaven" like? "Heaven is a real and breath-taking place. We will not wander about as disembodied spirits, playing harps throughout an ethereal expanse. We shall live forever in the presence of God. . . . We shall know an ecstatic, endless joy surrounded by an earth and heaven of indescribable beauty" (178). At the end of the millennium comes the truly new creation, new "in kind or order" and not merely new in "time." In the transition from all present and even future states of nature to this final state, a radical or ontological transformation occurs. Lindsey quotes from the Christian prophecy in 2 Peter 3:10–13, which includes this phrase: "The elements will be destroyed with intense heat." Lindsey interprets this as a reference to the fundamental elements of nature, which will be destroyed in cosmic conversion to a final state of creation. "Christ is going 'to loose' the atoms of the galaxy in which we live. No wonder there will be a great roar and intense heat and fire. Then Christ will put the atoms back together to form a new heaven and earth, in which only glorified persons without their sinful natures will live" (179).

Lindsey is widely influential in his own right, but his impact was magnified greatly by the novels of the end time written by Tim LaHaye and Jerry B. Jenkins, which basically created a story around Lindsey's apocalyptic vision. Of these, the novel *Left Behind: A Novel of the Earth's Last Days* is the most significant, selling millions of copies. A theme that runs through Lindsey—the desirability of anti-intellectualism—becomes even more explicit in *Left Behind*, when one of the book's main characters, a journalist named Buck, comes to a new insight as a result of a "miraculous"

deliverance of Israel from a Russian nuclear attack: "He had known beyond a doubt for the first time in his life that unexplainable things out there could not be dissected and evaluated scientifically from a detached Ivy League perspective. . . . Everyone in the world, at least those intellectually honest with themselves, had to admit there was a God after that night." What happened "was beyond all comprehension—apart from the direct intervention of God" (398).

Almost in reaction to the detailed specificity of Lindsey's account of the end times, Rick Warren claims less ability to know the future. In response to the popularity of Lindsey and similar writers, Warren states, "Today there's a growing interest in the second coming of Christ and the end of the world. When will it happen?" According to Warren (2003), Jesus himself answered this question. "He said in essence, 'The details of my return are none of your business. What *is* your business is the mission I've given you.'" Then he adds, "Speculating on the exact timing of Christ's return is futile" (285).

While we cannot know the schedule, Warren is confident that everything has a purpose because everything is planned by God. "God is not haphazard; he planned it all with great precision. The more physicists, biologists, and other scientists learn about the universe, the better we understand how it is uniquely suited for our existence. . . . If there were no God, we would all be 'accidents,' the result of astronomical random chance in the universe. You could stop reading this book, because life would have no purpose or meaning or significance. There would be no right or wrong, and no hope beyond your brief years here on earth" (24–5).

Here is where Warren's view of the future creates a tension within his theology. God creates everything for a purpose, and God's purpose is to give us eternal life "in heaven." Why, then, does God not just create us as perfect beings in our final destination? What is the purpose of our "brief years on earth"? Why did not God just create the final or "new" creation without putting us all through this less perfect one? According to Warren, "Life on earth is just the dress rehearsal before the real production. You will spend far more time on the other side of death—*in eternity*—than you will here. Earth is the staging area, the preschool, the tryout for your life in eternity. . . . This life is preparation for the next." Put another way, this life is a test. "Every time you pass a test, God notices and makes plans to reward you in eternity" (36). For Warren, this time on earth is God's way to prepare us for life beyond earth. "Why would God provide *heaven on earth* when he's planned the real thing for you in eternity? God gives us our time on earth to build and strengthen our character for heaven" (173).

What is eternity like? "What is it going to be like in eternity with God? Frankly, the capacity of our brains cannot handle the wonder and greatness of heaven" (38). Note that in Warren's theology, "eternity" and "heaven"

are interchangeable, sometimes combined as "an eternal home for us." There (and then), "in heaven we will be reunited with loved ones who are believers, released from all pain and suffering, rewarded for our faithfulness on earth, and reassigned to do work that we will enjoy doing. We *won't* lie around on clouds with halos playing harps! We will enjoy unbroken fellowship with God, and he will enjoy us for an unlimited, endless forever" (39).

So if life here is a preparation, how are we prepared? God changes our character but not our personality or uniqueness. "Let me be absolutely clear: You will never become God, or even *a* god. That prideful lie is Satan's oldest temptation. . . . . Many religions and New Age philosophies still promote this old lie that we are divine or can become gods." Warren continues, almost as if he has recent transhumanism in mind: "This desire to be a god shows up every time we try to control our circumstances, our future, and the people around us. But as creatures, we will never be the *Creator*: God doesn't want you to become a god; he wants you to become *godly*—taking on his values, attitudes, and character" (172). The change is moral, not metaphysical or even biological. It requires "a gradual, progressive development that will take the rest of your life." Warren adds: "You are a work in progress. Your spiritual transformation in developing the character of Jesus will take the rest of your life, and even then it won't be completed here on earth. It will only be finished when you get to heaven or when Jesus returns. At that point, whatever unfinished work on your character is left will be wrapped up" (176–7). Warren's comments call to mind the frequently quoted words of Nick Bostrom: "Transhumanists view human nature as a work-in-progress, a half-baked beginning that we can learn to remold in desirable ways" (Bostrom 2003b, 493). Warren and Bostrom share a general notion of human incompleteness, but their explanations of that incompleteness and of the coming fulfillment are profoundly different.

Bell (2011), the third writer to be considered, agrees with Warren about the need for human character to be improved. But he disagrees not just with Warren but with almost all other evangelical Christians—and apparently with 70 percent of the American public—in questioning the idea that a loving God created billions of human beings in the expectation of sending them to hell. The title of his recent book is *Love Wins: A Book about Heaven, Hell, and the Fate of Every Person Who Ever Lived.* In many respects, Bell embraces a non-apocalyptic view, portraying heaven and hell not as places but as future conditions that we create for ourselves and for our world. Countering writers like Lindsey, Bell thinks it is wrong to scare people into loving God, all the more so through what he sees as misguided interpretations of biblical texts. In contrast to Lindsey's view of the rapture or even Warren's view of heaven as a luminous but other-worldly place, Bell insists on reinterpreting biblical prophecy: "It's *here* they were

talking about, this world, the one we know—but rescued, transformed, and renewed" (34).

Not only that, but for Bell, human beings play a limited but important part in the work of transformation. Humans were created "to order, to participate, to partner with God in taking the world somewhere" (35). He goes on, "This participation is important, because Jesus and the prophets lived with an awareness that God has been looking for partners since the beginning. . . ." This is the God who "is the source of all life, who works from within creation to make something new. The God who can do what humans cannot. The God who gives new spirits and new hearts and new futures" (36). God is the power of love behind all existence, the power that transforms human beings but then engages them in the work of transformation. According to Bell, this is the message of the biblical creation texts: "Life is a pulsing, progressing, evolving, dynamic reality in which tomorrow will not be a repeat of today, because things are, at the most fundamental level of existence, going somewhere" (44).

Heaven, then, is the transformation occurring in front of us and within us. "What we find Jesus teaching . . . is that he's interested in our hearts being transformed, so that we can actually handle heaven." And why are we unable to "handle heaven"? As Bell describes it here, our problem is not the limitations of our biology but the character of our moral selves. Where Warren claims that our brains cannot handle the wonders of heaven, Bell says that we lack the necessary virtues and so we need moral transformation. Nevertheless, Bell cannot ignore the ontological question. Not just our characters but our bodies cannot "handle heaven." Referring to the teachings of St. Paul, Bell describes "two kinds of bodies. The first is the kind we each inhabit now, the kind that gets old and weary and eventually gives out on us. The second kind is one he [Paul] calls 'imperishable' (1 Cor. 4:15), one immune to the ravages of time, one we'll receive when heaven and earth are one. Prior to that, then, after death we are without a body. In heaven, but without a body. A body is of the earth. Made of dust. Part of this creation, not that one. Those currently 'in heaven' are . . . with God, but without a body" (56). In this context, Bell does not use the word "soul," but that is not to say that he avoids a strongly dualistic view of human nature as an essential self inhabiting an exchangeable, expendable body.

The disembodied "person" in heaven continues in that state for an interim period, what traditional theology called "the intermediate state." Aside from the obvious dualism required (a form of dualism that most biblical scholars insist is non-biblical), a key problem for those who endorse the intermediate state is that it has lasted at least 2,000 years, longer if the saintly before Christ are admitted, and has for all practical purposes become semi-permanent. One way to soften the doctrine is to see the disembodied dead as aware of themselves and not so far away. They may be "in heaven," but heaven is near, not up there. This is exactly Bell's move, and he is not

alone among younger evangelicals, especially those who put spirituality over orthodoxy.

In the future, according to Bell, there will be a "coming together of heaven and earth." In one respect, for Bell, the two are not so far apart even now. He invokes the notion of "thin places," special locales where people claim to sense the nearby presence of a spiritual dimension. "Jesus lived and spoke as if the whole world was a thin place for him, with endless dimensions of the divine infinitesimally close, with every moment and every location simply another experience of the divine reality that is all around us, through us, under and above us all the time" (60–1).

What, then, is hell? It is "the very real consequences we experience when we reject the good and true and beautiful life that God has for us" (93). It is not a place so much as the consequences of human choices. What makes Bell's view rather unusual for a Protestant is that he seems to embrace the idea that even after death, disembodied humans are given almost endless opportunities to embrace the love of God and to enter an eternal experience of the divine.

There are major differences among Lindsey, Warren, and Bell, and of course all three are at odds not just with nineteenth-century theology but also with most of the academic theology of the past 100 years. In official statements, however, most Protestant churches endorse views somewhat akin to Warren and Bell, and official Catholic teaching is also quite similar. For example, according to the *Catechism of the Catholic Church* (1995), this is what happens when a believer dies: "In death, the separation of the soul from the body, the human body decays and the soul goes to meet God, while awaiting its reunion with its glorified body. God, in his almighty power, will definitively grant incorruptible life to our bodies by reuniting them with our souls . . ." (260, para 907). Then, quoting the Fourth Lateran Council (1215), the *Catechism* adds: "So, in him, 'all of them will rise again with their own bodies which they now bear,' but Christ 'will change our lowly body to be like his glorious body,' into a 'spiritual body'" (260). The *Catechism* also speaks of "Christ's transfiguration of our bodies," (261) suggesting that the glorification of Christ in his resurrection is a preview of the destiny of all believers. Until this glorification, however, the souls of the righteous are "in heaven." "Heaven is the ultimate end and fulfillment of the deepest human longings, the state of supreme, definitive happiness" (267). Then, in terms that are implied but not explicit in Rob Bell, "All who die in God's grace and friendship, but still imperfectly purified, are indeed assured of their eternal salvation; but after death they undergo purification, so as to achieve the holiness necessary to enter the joy of heaven" (267). For the Catholic *Catechism*, of course, hell is a real possibility. "This state of definitive self-exclusion from communion with God and the blessed is called 'hell'" (269).

Lindsey's perspective includes the transformation of the cosmos. Warren and Bell accept the idea of cosmic transformation in general terms but have almost nothing to say in detail on that subject. In a similar way, the Catholic *Catechism* offers only these brief comments: "At the end of time, the Kingdom of God will come in its fullness. After the universal judgment, the righteous will reign forever with Christ, glorified in body and soul. The universe itself will be renewed . . ." (272). This will be a "mysterious renewal, which will transform humanity and the world. . . " (272). The result will be a "new universe." Then at last will come about the final condition of the cosmos, in which humanity and all creation will be united in joy in the presence of God: "The beatific vision, in which God opens himself in an inexhaustible way to the elect, will be the ever-flowing well-spring of happiness, peace, and mutual communion." When this happens, "the universe will be transformed" (273). Exactly what those changes will be like is not explained, perhaps because the Church accepts that the ancient texts are open to multiple interpretations and traditions are in conflict, making it difficult for theology today to say much more.

The Singularity as Secular Apocalyptic

The idea of a coming technological singularity, a time of wildly accelerated technological transformation, is most commonly associated with the writings of the inventor Ray Kurzweil, who stands somewhat on the margins of transhumanism but whose ideas influence many in the movement. The general idea of a technological singularity is widely held among transhumanists, but according to the "Transhumanist FAQ 2.1," the idea is not equally accepted by all transhumanists. "Transhumanists differ widely in the probability they assign to . . . [the singularity] scenario. Almost all of those who do think that there will be a singularity believe it will happen in this century, and many think it is likely to happen within several decades" (Bostrom 2003a). In other words, if there is a singularity, it is coming soon.

Occasionally, transhumanists use other terms to refer to what is essentially the same concept. For example, the Transhumanist FAQ 2.1 discusses the singularity with this explanation: "Enhancing intelligence will, in this scenario, at some point lead to a positive feedback loop: smarter systems can design systems that are even more intelligent, and can do so more swiftly than the original human designers. This positive feedback effect would be powerful enough to drive an intelligence explosion that could quickly lead to the emergence of a superintelligent system of surpassing abilities." The document claims that nearly all transhumanists accept the idea of "an intelligence explosion," a period of technological acceleration unlike anything before: "The vast majority of transhumanists think that superintelligence and nanotechnology will both be developed

in less than a hundred years, and many predict that it will happen well within the first third of this century. . . . Once there is both nanotechnology and superintelligence, a very wide range of special applications will follow swiftly" (Bostrom 2003a). One might ask whether transhumanists who endorse the idea of a coming technological singularity also think that it is a necessary step to the full realization of the transcendence of the human. Can we make ourselves fully transhuman, or must we create superhuman intelligence to do so? And if there is superhuman intelligence, are humans or even transhumans still needed?

The core concept of a technological singularity goes back more than half a century, long before transhumanism and Kurzweil's writings. The concept is borrowed from the use of the word "singularity" in recent cosmology, more specifically as part of the phrase "gravitational singularity." In cosmology, the term refers to the prediction that gravity—for instance, at the center of a black hole—causes the infinite curvature of spacetime. Part of the prediction is that the very laws of physics no longer apply at the singularity. Such ideas in physics may have sparked the notion of a "technological singularity," a coming period of such highly intensive technological advance that ordinary "laws" of future technological advance simply break down and the future after the singularity is unknowable.

The first use of the concept of a "technological singularity" is credited to Stanislaw Ulam (1909–1984), who in turn credits fellow-mathematician John von Neumann (1903–1957), both of whom worked on the Manhattan Project. In 1958, Ulam recalled this conversation with von Neumann: "One conversation centered on the ever accelerating progress of technology and changes in the mode of human life, which gives the appearance of approaching some essential singularity in the history of the race beyond which human affairs, as we know them, could not continue" (5).

In 1962, computer scientist Irving John Good (1916–2009) gave a talk, which in a later published form contained this passage: "Let an ultraintelligent machine be defined as a machine that can far surpass all the intellectual activities of any man, however clever. Since the design of machines is one of these intellectual activities, an ultraintelligent machine could design even better machines; there would then unquestionably be an 'intelligence explosion,' and the intelligence of man would be left far behind. Thus the first ultraintelligent machine is the last invention that man need ever make." In his talk, Good took the Ulam/von Neumann idea of "accelerating progress" to its next step. What drives the acceleration is the ultra- or superintelligence, each generation of which invents the next generation of even greater intelligence, which more quickly invents the next.

Another key step in the development of the idea of the technological singularity is credited to the mathematician and science fiction writer

Vernor Vinge. In his 1993 talk "The Coming Technological Singularity," Vinge predicted that within about 30 years, not later than the year 2030, "greater-than-human intelligence" would be created. According to Vinge, "When greater-than-human intelligence drives progress, that progress will be much more rapid. In fact, there seems no reason why progress itself would not involve the creation of still more intelligent entities—on a still-shorter time scale." He continues with this prediction: "From the human point of view this change will be a throwing away of all the previous rules, perhaps in the blink of an eye, an exponential runaway beyond any hope of control. . . . I think it's fair to call this event a singularity ('the Singularity' for the purposes of this paper). It is a point where our old models must be discarded and a new reality rules." Vinge, followed later by Kurzweil, calls attention to the radical nature of the singularity by capitalizing it, speaking of the Singularity.

Whether the technological singularity (if real) is to be loved or feared is a question easily ignored. To Vinge's credit, he is not just the first but among the few who see the danger that the singularity might pose. Commenting on I. J. Good's paper from the 1960s, Vinge writes: "Good has captured the essence of the runaway, but he does not pursue its most disturbing consequences. Any intelligent machine of the sort he describes would not be humankind's 'tool'—any more than humans are the tools of rabbits, robins, or chimpanzees."

Building on these ideas from Ulam, von Neumann, Good, and Vinge, recent transhumanists and technologists have developed the concept of a technological singularity in new ways. In a recent survey, Anders Sandberg comments that "the concept is used in a variety of contexts, and has acquired an unfortunately large number of meanings" (1). Taken together, the various accounts seem to affirm three key points, according to Sandberg (2010): "accelerating change, prediction horizon and intelligence explosion leading to superintelligence. . . [since] all involve the growth of technological or cognitive capability" (2).

Foundational to nearly every view of the technological singularity is the belief that the rate of technological development is accelerating. This development will lead inevitably to enhanced intelligence. Whether it is by producing machines that are smarter than humans or machines that make humans smarter, intelligence greater than that of today's smartest human beings will launch the next step, producing ever-more-intelligent "offspring." According to Kurzweil, in biological and technological evolution, there is a fundamental principle or law of acceleration, as advances in complexity make even greater complexity possible at ever-faster rates of development. This is the "law of accelerating returns (the inherent acceleration of the rate of evolution, with technological evolution as a continuation of biological evolution)" (7). For Kurzweil, technological acceleration is rooted in the very nature of things. "A primary reason that

evolution—of life-forms or of technology—speeds up is that it builds on its own increasing order, with ever more sophisticated means of recording and manipulating information. Innovations created by evolution encourage and enable faster evolution." He adds: "Evolution applies positive feedback: the more capable methods resulting from one stage of evolutionary progress are used to create the next stage" (40).

Kurzweil's vision of the technological singularity could not be more grand: "The Singularity will allow us to transcend these limitations [such as slow information processing in the brain] of our biological bodies and brains. We will gain power over our fates. Our mortality will be in our own hands" (9). In this vision, Kurzweil almost seems to say that the pathway to transhumanism is through the singularity. According to Zimmerman (2008), "By capitalizing 'Singularity,' posthumanists suggest that the event is not merely important, but numinous—that is, possessing what amounts to a sacred dimension" (351). While not itself divine, the singularity is the transition from the physical to the transcendent, from matter to intelligence.

The singularity is a process of transformation, rapid and beyond human control. Can anything be said about what it brings about? According to Kurzweil, the answer is yes. Kurzweil sees cosmic evolution as occurring in a series of epochs, six in all, with the singularity coming at the end of the fifth epoch. "In the aftermath of the Singularity, intelligence, derived from its biological origins in human brains and its technological origins in human ingenuity, will begin to saturate the matter and energy in its midst. It will achieve this by reorganizing matter and energy to provide an optimal level of computation. . . . The 'dumb' matter and mechanism of the universe will be transformed into exquisitely sublime forms of intelligence, which will constitute the sixth epoch in the evolution of the patterns of information." Kurzweil continues: "This is the ultimate destiny of the Singularity and the universe" (21).

Then within the sixth epoch, however, there is an additional set of steps as the singularity transforms first one region of the universe, then arises (or is spread to) other regions until the entire universe becomes intelligent. According to Kurzweil, when that occurs, "Ultimately, the entire universe will become saturated with our intelligence. This is the destiny of the universe" (29). However, it may also be the case that without our knowing, the singularity has already occurred in other regions of the cosmos and has saturated other local regions with intelligence. Despite the human search for extraterrestrial intelligence, and despite recent estimates of billions of potentially habitable planets in our own galaxy, no evidence of such intelligence exists. This leads to a further speculation by Kurzweil: "John Smart has suggested in what he calls the 'transcension' scenario that once civilizations saturate their local region of space with their intelligence, they create a new universe (one that will allow continued exponential growth

of complexity and intelligence) and essentially leave this universe" (358). At this point, Hal Lindsey's rapture comes to mind.

"Transcension" aside, the key point here is that by itself, Kurzweil's singularity brings the cosmos to the sixth epoch but does not bring about the final state of the universe. It brings local saturation with intelligence, but not infinite saturation. The singularity brings the first of several states, all "apocalyptic" in the sense that they are radically transformative, but each giving way (at least possibly) to a state of further realization of cosmic potential. The singularity, Kurzweil says, "does not achieve infinite levels of computation, memory, or any other measurable attribute" (485). He adds: "Of course, the capabilities of such an intelligence may appear infinite for all practical purposes to our current level of intelligence. A universe saturated with intelligence at 10^{90} cps would be one trillion trillion trillion trillion trillion times more powerful than all biological human brains on Earth today" (486). But the key point for Kurzweil is that if we can imagine a further state in the evolution of intelligence, then we can predict that it will happen. And so in the end, for Kurzweil, this is what we should expect: "We can imagine the possibility of our future intelligence spreading into other universes. . . . This could potentially allow our future intelligence to go beyond any limits. If we gained the ability to create and colonize other universes . . . our intelligence would ultimately be capable of exceeding any specific finite level" (486). Whether we can expect our intelligence to reach such heights is surely open to debate. And if it should ascend so high, can we still speak of it as "our intelligence," or have we merely been its launch vehicle, no longer needed or wanted?

Comparative Apocalyptics

The similarities and differences between popular Christian and transhumanist views of the future are multifaceted and complex. It is clearly not the case that one group expects dramatic changes, while the other does not. And while transhumanists disagree with one another about such things as the singularity, Christians disagree even more among themselves in their expectations of the future. Because Christians have engaged in reflection and debate for 2,000 years about possible radical transformations in the future, it is possible to step back from that process and ask whether there is some sort of generational constraint at play that checks the credibility of views like Lindsey's and Kurzweil's. When predictions of the future include a schedule that is measured in a few decades, and the predicted events do not occur, confidence in the specific claims is undermined. The broader faith—whether in God's intervention or in the rise of the singularity—may remain, but specific predictions are revised to match developments.

For example, the first Christians thought that the resurrection of Jesus would be followed within a space of a few decades by the resurrection of all the dead. As generations passed, expectations of the future and beliefs about the state of the dead, along with nearly every other article of faith, were significantly modified to fit the growing realization that generations continue to come and go and that history moves on with merely historical but not cosmological changes. In some respects, the transition from the unsustainable view of Lindsey to the more minimal and flexible views of Warren and Bell represents yet another adjustment—in this case within the specific community of American evangelical Christianity during the previous 50 years. Whether predictions about the coming singularity come true or whether visions are modified remains to be seen.

Deeper levels of similarity and difference between popular Christian and technological visions of the future can be explored by considering three questions. First, if profound changes lie ahead, what can be said now, according to popular Christianity or technological futurism, about how the future will be significantly different from the present? Second, what are the causes of the change that may lie ahead? Is there an underlying power or underlying cosmic trajectory that determines the general direction of the change? If so, is it one power or two, benign or evil? Do human beings play a role in causing the change? Are we in any sense in control of the processes of change? Finally, is there a sequence or a series of stages or states in the changes that lie ahead? If so, can we know anything about them?

What can be said, then, about the nature of the changes that lie ahead? How will the future be different from the present? In popular Christianity as well as among secular futurists, there are at least three possibilities. The first is that historical changes continue, perhaps accelerating in pace, ushering in a future incrementally. For all practical purposes the future is different from the present, but it grows out of the present and its possibilities by means of the familiar processes of historical change. Most Christians reject this view, as do many transhumanists (specifically those who accept some account of a coming technological singularity). The second option is to see the future as providing passage to a new location, either through space travel or, in the case of Hal Lindsey, by being raptured or taken up from this world and raised to a different place. In either case, the human beings themselves are largely unchanged. They are simply relocated. Many people, not just Christians, seem to view heaven and hell as places to which the dead go after life in this world. For some (the more common view), the dead go to heaven as disembodied spirits, separated from their bodies but otherwise unchanged, a view consistent with strongly dualistic "folk psychology." The third option is to expect some sort of cosmic transformation, the end to this universe as we know it and its transformation into something quite different. For thinkers as different as Kurzweil and Lindsey, nature itself,

through a series of dramatic stages, is radically changed from its present condition. Others, too, hold to various versions of the view that a new cosmos or a new creation is coming or "becoming," although very few describe their views in comparable detail. The Catholic *Catechism* is fairly typical in that respect, asserting confidence in cosmic transformation but providing almost no description of what lies ahead.

For Lindsey and Kurzweil, however, the universe itself will be transformed or transfigured, down to the level of the fundamental parameters of the physical order. In Lindsey's writings, there is an extensive discussion of historical changes. Despite a clear claim of cosmological changes, however, there is little detailed speculation on how the cosmos will be transformed, much less any attempt to describe it in scientific terms, except to say that the fundamental properties of nature will somehow be changed. For Kurzweil, the transformation comes as the technological singularity makes the universe intelligent. Other futurists might offer different perspectives on how nature might be changed through emerging technologies, such as nanotechnology or synthetic biology.

The second question—what causes the transformations of the future?—points directly to the question of technology. For Lindsey, technology is part of the problem, merely magnifying the consequences of human brokenness. The powers of evil, Satan and the anti-Christ, use misguided humans to bring about such things as nuclear war and social collapse. Only God can rescue the creation and deliver believers from the chaos to come. On the question of the human role and the place of technology, the major difference between Lindsey and Kurzweil becomes clearly visible. For Lindsey and for millions of American fundamentalists, the assessment of technology is largely negative except for medicine and for its usefulness in promoting their message.

For Kurzweil, technology plays the decisive role by giving rise to the singularity. Among the advocates of human enhancement through technology and among transhumanists, other nature-changing effects of technology are seen as important. But just how far can technology change nature? At the moment, its impact, although pervasive and culturally profound, is actually quite limited and indirect. But future technology (nanotechnology, quantum computing, and synthetic biology in particular) may not merely reorder nature but bring into existence new molecules unlike anything already existing or new organisms based on different biological systems not used in nature, at least not on earth. In that case, will the principles of chemistry and biology still obtain? Will technology ever give rise to anything that is qualitatively different in a way that is comparable to the original emergence of life or consciousness? Will some new level of reality emerge, requiring a new science? According to Robert Service, "There is no synthetic astronomy or synthetic physics, at least for now" (Service 2005, 95). Future advances in technology may change

this, particularly if there is any plausibility to the notion that greater-than-human intelligence will take over the work of technological innovation.

Bell and Warren stand apart somewhat from Lindsey, insisting that while technology cannot save us or solve our spiritual or moral problems, it is the source of much good in the world. They do not accept the optimistic view of previous centuries or look for human moral improvement to bring about a new age. For Warren and Bell, human-engineered redemption, by moral uplift or technological enhancement, is simply not possible except in very limited or transitory ways. The future is assured, however, because of God, who is one and all powerful and who can be trusted to bring the future to a positive, even glorious conclusion. For Lindsey, there is of course only one God but also a very powerful Satan, one Christ but also a fairly powerful "anti-Christ," and the future is realized through a kind of mythic conflict between cosmic forces of good and evil. Humans are swept up in the conflict and many suffer greatly as a result, but they play almost no role at all in driving it or determining its outcome. Nuclear weapons may be used, but they are no longer under human control. At most, each individual decides whether or not to "accept Jesus" and ride out the storm among the raptured saints. The most obvious secular counterpart to Lindsey is the suggestion of Vinge (1993), for whom the coming superhuman intelligence may or may not be benevolent. Or even more like Lindsey are the science fiction accounts of superhuman civilizations or systems in conflict that determine the future of the cosmos. Kurzweil's view, while "theistic" only in the sense that "God" arrives at the end, is more akin to Warren or Bell, with a remarkable confidence that the evolution of intelligence is good or, as Bell puts it, "Love Wins."

Finally, is there a sequence or series of significantly distinct stages or states in the changes that lie ahead and can we know anything about it? Most people claim that there are no such changes, or that we cannot know anything much about them, or that they lie in the far-distant cosmic future, a subject for cosmologists' debate but existentially irrelevant. The individuals discussed here, however, see significant changes coming sooner. And while they disagree on many things, Kurzweil and Lindsey, at least, agree on three things: that these changes are coming within a generation, that they will consist of distinct stages, and that these stages may be known in advance.

For Lindsey, the transformations have already begun with the intensified political crises in the Middle East, followed by the "rapture" when Jesus comes near to the earth and gathers up those who believe in him to meet him in the sky. This is followed by the seven-year tribulation, the first half of which is relatively calm as the anti-Christ brings one government but then becomes more chaotic and violent as the anti-Christ's true identity is revealed. This period is ended with the return of Jesus to earth and the general resurrection of all the dead of past human history to face a judgment

that will determine their eternal destiny. Then begins the millennium, when Jesus reigns for 1,000 years of peace and prosperity, followed by another revolt that is put down in a final conflict of good and evil. Then at last for Lindsey the cosmos itself is changed as the basic nature of reality is transformed.

If Lindsey looks to developments in the Middle East as the beginning of the countdown to the end, Kurzweil sees the rapid advances in technology today as the beginning of the acceleration that leads to the singularity. The radical transformations of the future have already begun with the quickening pace of technological advances, especially in supercomputing, artificial intelligence, and what Kurzweil calls "spiritual machines." Next comes the possibility of uploading the full contents of the minds of human beings so they may continue to "live" indefinitely. Then comes the singularity, when superhuman intelligence leads to advances so rapid that the pace of change becomes dramatically fast, almost instantaneous, resulting in the saturation of matter by intelligence, at least in that region of the cosmos where the singularity occurs. One possibility at this point for Kurzweil is "transcension," in which the superintelligence of one cosmic region somehow leaves the cosmos in a departure that is oddly reminiscent of Lindsey's rapture. This is followed by the saturation of the entire universe by intelligence, and then the intelligent universe creates other universes, repeating the process indefinitely. With all their differences, Kurzweil and Lindsey show surprisingly strong similarities in the multistage sequences that characterize their views of the transformations of the future.

The difference between Kurzweil and the religious writers considered here centers on the question of the human role in bringing about these transformations, but this difference is not absolute and should not be overstated. For Lindsey, humans barely comprehend, much less play, a leading role in these events, except for the anti-Christ, a grandiose human action figure who serves as a foil to the main action. Technology solves nothing for Lindsey, only making matters worse. And even though Warren and Bell stand apart somewhat from Lindsey in their view of the positive effects of technology, they still claim that our choices determine only our personal destinies, falling far short of contributing in any significant way to the transformations of the future. For Kurzweil, on the other hand, technology plays the decisive role in giving rise to the singularity. Once that happens, however, the direct human role recedes and intelligence itself transcends the human level as it attains superhuman levels. Only such superhuman intelligence can bring about the changes Kurzweil envisions. The technology directly created by human beings gives rise to the singularity and all that comes in its wake, but it only goes so far before superhuman intelligence takes over. All these writers agree that the future will be radically different from the present and that superhuman powers will cause this transformation. For the religious writers, this power

is God, who is there at the beginning and who will draw the cosmos to its divinely appointed end. For Kurzweil, there is a god-like intelligence that becomes actual through the cosmic process, as much an effect as a cause, a highly revised form of theism quite at odds with traditional theistic beliefs and reminiscent of the philosophy of Alfred North Whitehead or Charles Hartshorne.

References

Barth, Karl. 1933 [1918]. *The Epistle to the Romans*, translated by Edwyn Clement Hoskyns. London: Oxford University Press.

Bell, Rob. 2011. *Love Wins: A Book about Heaven, Hell, and the Fate of Every Person Who Ever Lived*. New York: HarperOne.

Bostrom, Nick. 2003a. "The Transhumanist FAQ 2.1." http://www.transhumanism.org/resources/FAQv21.pdf.

_____. 2003b. "Human Genetic Enhancements: A Transhumanist Perspective." *Journal of Value Inquiry* 37(4):493–506.

Catholic Church. 1995. *Catechism of the Catholic Church*. New York: Doubleday.

Gallup News Service. 2007. "Americans More Likely to Believe in God than the Devil, Heaven More than Hell." Princeton, NJ. http://www.gallup.com/poll/27877/americans-more-likely-believe-god-than-devil-heaven-more-than-hell.aspx.

Geraci, Robert M. 2010. *Apocalyptic AI: Visions of Heaven in Robotics, Artificial Intelligence, and Virtual Reality*. New York: Oxford University Press.

Good, Irving John. [1962, 1963] 1964. "Speculations concerning the First Ultraintelligent Machine." http://www.acceleratingfuture.com/pages/ultraintelligentmachine.html.

Kurzweil, Ray. 2005. *The Singularity Is Near: When Humans Transcend Biology*. New York: Viking.

Lindsey, Hal, and Carole C. Carlson. 1970. *The Late Great Planet Earth*. Grand Rapids, MI: Zondervan.

Rahner, Karl. [1954] 1961. *Theological Investigations, Vol. 1*, translated by Cornelius Ernst. London: Darton, Longman and Todd.

Sandberg, Anders. 2010. "An Overview of Models of Technological Singularity." http://agi-conf.org/2010/wp-content/uploads/2009/06/agi10singmodels2.pdf.

Service, Robert F. 2005. "How Far Can We Push Chemical Self-Assembly?" *Science* 309(5731):95.

Vinge, Vernor. 1993. "The Coming Technological Singularity: How to Survive in the Post-Human Era." http://www-rohan.sdsu.edu/faculty/vinge/misc/singularity.html.

Warren, Rick. 2003. *The Purpose Driven Life: What on Earth Am I Here For?* Grand Rapids, MI: Zondervan.

Zimmerman, Michael E. 2008. "The Singularity: A Crucial Phase in Divine Self-Actualization?" *Cosmos and History: The Journal of Natural and Social Philosophy* 4(1–2):347–70.