



Marc J. de Vries

Utopian Thinking in Contemporary Technology versus Responsible Technology for an Imperfect World

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In several contemporary technological developments, the expectations people have of the new technology is framed in terms of the prospect of an ideal world. This utopian thinking is featured in at least three technological domains, namely, medical nanotechnology, virtual realities, and sustainable technologies. Some authors have ascribed this to Christian sources, but there are strong arguments against this claim. This kind of utopian thinking denies the influence of sin and its consequences on human thinking and acting, ideas that are significant in Christian thinking. A more balanced approach is needed, one which takes into account the nonideal state of reality, a condition present until the end of time.

In the rhetoric accompanying several contemporary technologies, we find clear traces of utopian thinking; namely, the idea that an ideal world can be realized by means of new technologies.¹ According to David Noble, the origin of this kind of thinking in technology is attributable to the Christian concept of Paradise.² In Christian thinking, however, paradise cannot be restored by humans. It is God who will create a new heaven and earth in which the brokenness that characterizes our current world will no longer be present. Until then, responsible technology means having technology that operates in an imperfect world.

Christian Origins of Utopian Thinking?

The meaning of the word utopia stems from the Greek: it denotes nonplace (*ou topos*).³ The term was used by Thomas More as the title of his book of 1516 in which he described an ideal state. Since

then, the term is used for any ideal world one can imagine but that does not exist (hence the term, nonplace).

Francis Bacon in *The New Atlantis* (1627) promoted experimentation in the natural sciences since this would bring about endless new opportunities for controlling nature, enabling humans to create an ideal world. One of the means by which humans have tried to create these ideal worlds is technology.⁴ The development of technologies has always been and still is driven by promises and expectations.⁵

Marc J. de Vries is an affiliate professor of Christian philosophy (of technology) at Delft University of Technology, the Netherlands. He also has a chair in science education at the same institution. At Eindhoven University of Technology, the Netherlands, he serves as an assistant professor in philosophy of science and technology. His background is in physics (MSc). He is editor-in-chief of the International Journal of Technology and Design Education, published an introductory book on the philosophy of technology for educators (Teaching about Technology), wrote a monograph on the history of the Philips Research organization, and is a member of the editorial board of *Philosophia Reformata*, an international journal. He also coauthored the book *The Matrix Reformed*, treating science fiction movies and Christian philosophy.

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In his book *The Religion of Technology*, David Noble argues that the Christian concept of Paradise is the origin of utopian thinking in technology.⁶ Christians, according to him, have learned from the Bible that there was an original ideal world in which there was no disease, no pain, no human death, nor any other form of suffering. But this Paradise was lost when humans sinned, and ever since, we have lived in a broken world. However, the ideal of restoring Paradise motivated people to create artifacts of various kinds in order to recapture this ideal world of Paradise. In the first part of his book, Noble takes his readers on a historical tour. He shows how utopian thinking in the Middle Ages raised the status of technology. Since then, the Paradise ideal has motivated people through the ages to develop ever-new technologies. In the second part, Noble uses a thematic approach to argue that, in all the major domains of technology, we find this utopian thinking. It is striking that he also includes non-Christians as examples of people who were influenced by this thinking. In particular, the fact that he mentions Auguste Comte, as such an example, makes clear that the Paradise ideal can remain active in a secularized form even when people have turned their back on their Christian past.

Although at first sight Noble's arguments seem plausible, there is one major aspect of Christian thought that he completely ignores. One can question if this was done on purpose, because in some cases, his selection of persons to illustrate the Christian origin of utopian thinking in technology is quite peculiar. A case in point: one of the historical chapters is devoted to the Reformation era, but nowhere in that chapter does Noble discuss the contribution of John Calvin. Since Calvin wrote extensively about the value of culture for Christians and non-Christians, the reader would have expected that he would be featured in this chapter. But Calvin definitely does not fit into Noble's argumentation. Calvin always pointed out that sin has thoroughly pervaded all human thinking and acting, and makes it entirely impossible for us to restore Paradise by ourselves.⁷ It is only through the work of Jesus Christ that restoration becomes possible, and even then, it is only fully realized when Christ returns at the end of history. Instead of Calvin, Noble refers to movements such as those begun by Anabaptists to support his argument. At that time, the possibility of

restoring Paradise and realizing the New Jerusalem on Earth was quite real for them. But one doubts that they were in the mainstream of Reformation era thought.

Noble's attack on Christian thinking as the origin of an unlimited and relentless effort to realize Paradise on Earth, at whatever cost, is similar to Lynn White's accusation that Christian thinking was the cause of the irresponsible exploitation of resources.⁸ He, too, is selective in his references. He suggests that mainstream Christian thought originates from the biblical notion that humans have been given the task of exploiting the earth and ruling over all living and nonliving beings. White, however, fails to notice that throughout history, there have been theologians who have emphasized that the term "rule over" in Hebrew has the meaning of "taking care of someone else's goods" rather than exploiting these goods for one's own interests. In a way, White, like Noble, suggests that Christians still have Paradise (and the permission to exploit that place) in mind when developing culture in general and technology in particular. But, as with Noble, White has to be selective in calling for witnesses, since many mainstream Christian thinkers do not comply with this image of the Christian attitude toward the concept of Paradise. Rather, it is a secularized form of the Paradise ideal that moves people in a direction to assume that there are no limits to its motivating force; this assumption causes people to develop technologies in often irresponsible ways.

An example of this can be found in the science fiction television series *Star Trek*. This series has many strong utopian references. Thanks to almost unlimited technological possibilities, humans can travel over unimaginable distances, heal the most life-threatening diseases and wounds by simply moving an electronic device over their body, communicate with other beings without any language barrier so that peace can be established between all species, and create any desirable meal by telling a replicator to produce it instantaneously. The series was conceptualized by Gene Roddenberry, who explicitly stated that he was driven by a humanistic approach to life.⁹ Human beings are good in principle. In the end, if they release their creative powers in technology, all will be well; all suffering and war will be no more.

The value of Noble's and White's writings and of Roddenberry's television series, however, is that they are right in identifying utopian thinking as a driving force behind technological developments. As I will show in the following sections, this kind of thinking seems to be gaining popularity today, at least when we consider the rhetoric that accompanies many contemporary technological developments. I will show the presence of this thinking in three important domains in current technology and then show what a Christian response could be. I will argue that the biblical foundation for such a response includes not only the notion of human responsibility, but also the imperfection due to sin and the perfection to be realized only after Christ's return.

Utopian Thinking in Medical Technology

One of the emerging new technologies of our time is nanotechnology. This is a technology about which many moral issues have already been discussed.¹⁰ Actually this is not one technology, but an umbrella term for many technologies, all of which, in one way or another, aim at manipulating particles at the nano-level, that is, at the level of nanometers (one nanometer is one billionth of a meter). Among existing applications is the production of materials with layers of particles that are only a few nanometers thick, for example, suntan lotion or toothpaste with a layer of nanoparticles which has special protective properties. The long-term aim of nanotechnology is the manipulation of individual atoms and the ability to build structures by connecting atoms one by one (molecular nanotechnology).¹¹

One of the most important application areas is in health care. Here we can find several examples of a striving for perfection or utopian thinking.¹² Current speculations suggest that one day engineers will be able to build or repair human tissue by manipulating individual atoms. It would then be possible to undo the damage done by the aging process. By repairing brain tissue at a sufficient speed, humans would be able to keep ahead of the point at which the dying process begins. Thus a person's lifespan could be extended by decades or centuries, and perhaps as long as a person chose to go to the nanodoctor. This would mean a sort of eternal life,

although the term eternal dying would be more appropriate since brain tissue keeps degrading and will always need periodic repair. The promise or hope is that humans can eradicate death by means of technology. This hope was already expressed before the coming of nanotechnology, by transhumanists. Now they see nanotechnology as a possible means for realizing this ideal. Ray Kurzweil is a famous example of this "school" of thinking.¹³

This hope differs fundamentally from a biblical view of human life and death. In a biblical perspective, human death¹⁴ is part of the curse caused by sin and can be removed only through the work of Christ after his return to Earth at the end of history. Until then, death is the gateway to life in heaven for those who have committed themselves to the redemptive work of Christ. The road to the tree of life in Eden's garden is blocked by an angel with a sword. The claim of nanotechnology suggests that humans have found a way to get around that angel and reach the tree of life without God's intervention. In other words, Paradise will be regained by means of nanotechnology.¹⁵ Many nanoscientists refuse to take this claim seriously as it is extremely speculative, but the rhetoric certainly is there and even plays a role in acquiring funding for nanotechnological research. In addition, in the biblical story of the building of the tower of Babel, we read that God himself described the possibilities of human endeavor by saying that "nothing will be restrained from them, which they have imagined to do" (Gen. 11:6b, KJV). This is confirmed by the many wrong predictions made about the limits of what humans can accomplish, for instance, the assumed impossibility of air traffic or of placing a human on the moon. The utopia of eternal life will be sought, and we cannot be sure how far humans will be able to go on this road.

A similar utopian aim in medical nanotechnology is to acquire a continuous and complete knowledge of our health status, made possible by using "lab-on-chip" technologies. These allow for a complete blood and DNA analysis, using as little as a drop of blood and at a price that anyone can afford. These analyses would enable people to monitor not only their current condition, but also the chance of developing diseases in the future. Having this knowledge gives a person at least a feeling of control, even though not all diseases can be avoided by making lifestyle changes. But coupled with the expectation

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that nanotechnologies can also be used to manipulate DNA, nanomedicine holds the promise that hereditary diseases can be avoided by repairing the section of the DNA strand that contains the threat. This would mean the abolishment of all diseases, which again is a promise of utopian character. In a biblical view, diseases are, like human death, the effect of the curse humans have brought upon themselves by sin. For this, too, humans now claim to have found an antidote that does not require redemption by Christ.

A third example of utopian thinking in nanotechnology is the creation of human-machine integrated beings, or “cyborgs.” By creating seamless transitions from human tissue to artificial materials, the boundaries between humans and machines seem to blur. A person cannot tell where the human part ends and where the artificial part begins, because the atoms in place do not reveal whether they are of natural or artificial origin. Geertsema has shown that this blurring only holds in a materialist view of reality, and therefore cyborgs will remain a myth.¹⁶ But even given the impossibility of creating a cyborg in the sense of a perfect human-machine integration, we already know that human bodies can be enhanced by technologies (prostheses, for example). Nanotechnologies could extend these possibilities enormously. Direct connections between brain tissue and computers could allow physicians to read the electrical signals in the brain much more immediately and precisely than we can do now with scans or EEGs. We can also stimulate the brain directly and thus bring in new signals from the outside. As the neurosciences reveal more and more connections between the signals in the brain and mental activities, these signals will, no doubt, have an impact on the “enhanced” human being’s thinking. The concept of cyborgs almost by necessity contains the promise of a super-being that has capabilities beyond our imagination. Here, again, we see utopian promises being made by means of anticipated technological developments.

Utopian Thinking in Virtual Worlds

A second domain, in which we find utopian ambitions in emerging technologies, is that of virtual realities or virtual worlds.¹⁷ Probably the best-known

example of this is Second Life, a virtual world that contains almost every aspect of real life. We can create our own avatar, give it the properties we want (male or female, desired moods, appearance, etc.), and enter the virtual world to meet other avatars, to shop, to study, to start a business, and to perform many other activities. This virtual world has certain utopian features. For instance, the possibility of choosing our own character is something impossible in “First life.” We can alter our character only by great effort. But the avatar in Second Life can be changed at will, which gives a person a flexible identity.¹⁸ This means that the natural “laws” in the human psyche (studied in psychology) can be overcome in the virtual world, at least, so it seems.

Another constraint in the real world is that our acts cannot be undone, and we have to take responsibility for our deeds.¹⁹ In a virtual world, however, once we have committed something we regret, it is a simple matter to remove our avatar and start all over again with a new one, walking away from the consequences of what we have done. We can also question if acts in the virtual world have any consequences in the real world. This was a matter of importance when the first rape was committed in Second Life.²⁰ The person behind the raped avatar really felt raped, but the person behind the avatar raping her claimed that no real rape had occurred because no physical act had taken place. The fact that the raped person (and not just her avatar) felt raped shows that it is an illusion to think that we can escape the real world by entering the virtual world. Behind our avatar is our own “First life” mind that cannot but obey the “First life” order that God has created.

The above was humorously illustrated by the makers of the television series CSI: NY, in an episode in which the crime investigators tried to solve a murder committed in real life by trying to find the avatar of the murdered person in Second Life. Mac Taylor, the male detective, tried to approach the murderer by using an attractive female avatar. However, his female colleague, Stella Bonasera, soon had to take over, because, as a male, Taylor simply was not able to make his avatar behave in a female manner. Trying to negate this fact is an attempt to break away from a protection that God built into the created world. Clearly, it is not healthy to keep shifting from one character to the other. In the first place,

there is a danger that we may become uncomfortable with our “First life” character, but we are still confronted with it each time we return to the real world. In the second place, we can become confused about our real identity after having changed identities so frequently.²¹

Utopia Thinking Even in Sustainable Technologies

The term “sustainability” was coined by the Brundtland Commission and was defined as follows: sustainable developments are those that “meet present needs without compromising the ability of future generations to meet their needs.”²² This seems to be something that should always be strived for, given the ecological problems we are faced with today. It should definitely be advocated by Christians, as it relates directly to the biblical notion of stewardship.

There seems to be, however, a utopian notion in this definition that is hardly ever noticed. The definition suggests that every next generation ought to have the same resources as the current generation. If this is taken literally, it contains a perspective of eternity, similar to the one we noted in nanomedicine. It would mean that all decay is compensated for technologically, and no loss of resources ever takes place. We could perhaps say that this was never consciously included in the Brundtland definition. However, in the Cradle-to-cradle approach to sustainability developed by William McDonough and Michael Braungart, it seems to be taken in that literal sense indeed.²³ The Cradle-to-cradle slogan is “waste is food.” This means that waste from one process can always be used as the input (“food”) for another process.

In a television documentary (aired in 2006 by the Dutch broadcasting company VPRO), we can hear Braungart say literally that it is fine to produce waste, as it is a positive action because it provides food for a subsequent process. This seems to contradict not only all previous policies aimed at preventing waste, but also the second law in thermodynamics that tells us that there is always a loss of quality in energy conversion. When people produce waste in a careless way, expecting all waste to be reusable, they enhance the environmental problems substantially, and the utopia soon turns into a dys-

topia.²⁴ It also contradicts the biblical word that the earth “shall wax old like a garment” (Ps. 102:26). This wearing away and decay of the earth is a consequence of the curse we have brought about.²⁵ But again and again, we see technological claims that humans can overcome the effects of this curse.

The Utopias Appear to Be Nonplaces

For each of the domains discussed in the previous sections, we can see the first signs of the anticipated utopias actually being nonplaces. Karl Popper argued that the whole idea of utopias in society is flawed, and even though his argument may not be entirely correct, he still should be taken seriously, given his importance as a philosopher.²⁶ For each of these domains, utopian promises are disturbed by experiences of undesired effects caused by efforts to realize the utopia. We have already mentioned a few when we discussed the virtual worlds and the sustainability ideals.²⁷ Also, in the domain of the application of health care, first concerns about dystopian effects have been expressed.

The idea of extending our lifespan indefinitely may sound attractive at first, but it raises fundamental questions about how we view human beings. It seems that much of what we do is driven by an awareness that we have only a limited time to accomplish our goals in life. Are we still motivated to take initiatives, given the prospect of endless time? Do we have the courage to start a study knowing that we still have hundreds of years to go? And if that endless life is without diseases, what will that do to our character? It is known that physically we grow stronger by being engaged in a constant battle against viruses and bacteria and that we become vulnerable when we are constantly protected from these attacks on our health. But, mentally and spiritually, having to struggle with setbacks helps us to develop character. What will happen if we can find easy solutions for any problem we encounter? Furthermore, some of the technologies with utopian promises bring about threats to the values of human integrity and human identity.

Nanochips that are implanted with the utopian promise of enhancing our brain capacities will influence our thinking in ways that we do not as

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yet know. We already know that drugs can have a strong impact on our personality. How much more could this be the case with electronic devices that have been designed to do just that? How can we guarantee that we have control over these devices, not only before, but also after they have been implanted and begin to influence us?

The same value of human identity is at stake when we attempt to reproduce human life. Cloning may result in two human beings with identical memories. Will they, or we, be able to sort out who was the original and who is the clone? In the movie *The Fifth Day*, this problem is played out in a fairly convincing way. So the utopia of creating human beings with enhanced capacities may turn into a dystopia of loss of identity. Similarly, a utopia of human enhancement may result in a dystopia of loss of integrity. Nanorobots invading our human bodies may seem an attractive way of repairing damage within the body that would otherwise require surgery, but when control over these devices is lost, they may do more harm than good. The same holds for nanocoated drugs that fall apart only where chemical substances which indicate tumors or infections are present. How can we know that the coatings, once removed, do not pervade other parts of the body and become a new asbestos problem, perhaps even more serious than the original one? These are some of the examples of how utopias can suddenly become dystopias.

Several authors have pointed out the dangers of utopias turning into dystopias. Already in 1943, the famous Christian apologist C. S. Lewis warned in his book *The Abolition of Man* that the utopia of creating superhumans in Nazi ideology would mean the loss of human values.²⁸ The next (genetically manipulated) generation would in fact have less, rather than more, control, as they would have no say in the manipulations that made them into what they would be. Similar warnings (but not from a Christian perspective) were uttered by Günther Anders, first in the 1940s and 1950s, with respect to the atomic bomb and other applications of nuclear energy, and later with respect to mass production and television.²⁹ Bill McKibben, in his book *The End of Nature*, warned that utopian striving for improvement through biotechnologies will, in the end, lead to the destruction of human life.³⁰

However, even when a utopia does not turn into a dystopia, it can prove to be a nonplace. It is known that women who have had cosmetic surgery soon “discover” that they need another body improvement to reach the happiness they desired when entering the world of cosmetic surgery. True happiness is always one cup size or face lift away. In the meantime, a lot of money is invested in pursuing an ideal that is often not realized.

A Christian Response: Responsibility in Brokenness

It is striking that the theme of utopian thinking in technology has long been featured in the history of philosophy of technology. In a recent survey of the history of philosophy of technology in the Netherlands, I was struck by the fact that several inaugural lectures of professors in philosophy of technology contained this theme in a prominent way. Dutch philosopher of technology Hans Achterhuis even made it a main theme in his whole philosophical oeuvre.³¹ He particularly points out the danger of pursuing utopias, in that they make people forget to take into account constraints that safeguard the responsible development of technologies. Or, as van de Poel and Royakkers formulate it, human technological enthusiasm has the inherent danger of easily overlooking possible negative effects of technology and the relevant social constraints.³²

In fact, this is what Noble accused Christians of doing, in his book *The Religion of Technology*.³³ Earlier, I refuted Noble’s claim by pointing out that Christians are, or at least should be, aware of the fact that fallen humans are unable to bring about a perfect world. However, there is a second element in a Christian response to Achterhuis’ concern, that Noble also overlooked. In a biblical perspective, there is an awareness of boundaries that hold in reality and limit our human interventions. In part, these are given with the natural order that God has imposed on reality. These boundaries are the cause of some of the “cracks” in the surface of utopias such as virtual worlds.

As we saw, nature does not allow us to alter personality in an unlimited way, just as we cannot ignore the law of gravity and other regularities (“laws”) that hold for the behavior of created reality.

These laws do not require our obedience (gravity works regardless), but we are obliged to take them into account when developing new technologies. A second component of the boundaries limiting our human endeavor comprises laws that do require our obedience. Probably the best-known examples of these are the Ten Commandments. In general, they are the expressions of God's will graciously offered to advance human flourishing. Among these expressions are those that relate to personal identity and integrity. Although we do not find these exact terms in the Bible, the way that the creation of humans is described, as well as many other statements about the nature of humans, makes it clear that humans have a special position in reality and that the human personality is something that we should not tamper with, whether it be our own personality or that of others.³⁴

Instead of trying to realize a utopia, a Christian perspective should be aimed at developing technologies for an imperfect world. In a way, this is what engineers normally do. In that respect, all this utopian rhetoric must often sound strange to engineers, since they know by experience that, at the very heart of a problem in engineering design, a designer must deal with conflicts in the list of requirements and make appropriate trade-offs. This is what engineers learn in their education, and in practice, they find out the importance of these considerations. Here we see confirmation of what C. S. Lewis claimed in his book *Mere Christianity*,³⁵ namely, that the Christian approach is the most rational one. It is an illusion to believe that we can realize a utopia through technology. Rather, we should learn to deal with the imperfection of reality.³⁶

There are at least two types of imperfections that engineers (and users of technology) should consider, rather than ignoring them in an utopian approach. First, the natural aspects of reality are imperfect, but so also are the human aspects. We have seen that utopias can turn into dystopias if we try to go against natural laws, such as the relative stability of our personality in "First life" or the unforeseen effects of nanoparticles in our body. These natural laws at first sight may seem to hamper the engineers' work because they limit human freedom. But at the same time, these laws are necessary conditions for life and for engineering. No device could be designed without the certainty that the law of gravity, and indeed

that all other natural laws, would hold in the future. The ordered behavior of reality is what makes design possible, and, indeed, life in general. This order was created and is still maintained by God in order to make reality a place we can live in. Trying to abrogate these rules in order to claim autonomous freedom is likely to result in a loss of safety and control. Utopias based on this are not only places that do not exist ("nonplaces") but are also places that were never meant to exist as long as God's curse pertains to this reality.

There is a second type of imperfection, namely the one that resides in our human nature. Humans are imperfect beings in a moral sense. In spite of the high moral expectations assumed in a humanistic approach, reality shows time and time again that humans will abuse technologies in some way or other. Even when we start out by developing and using technologies with the best of intentions, sooner or later our motives will form a hybrid: good and bad intentions will mix, and the result will be irresponsible behavior to a greater or lesser degree. When designing, engineers normally take for granted that users will deal with their products, honoring the aims they were designed for. This is what we call a "proper function."³⁷ But the designers' control over the users' handling of the artifact is limited. There are also "accidental functions." A screwdriver is designed for getting screws into and out of a surface, but many do-it-yourself enthusiasts use it for opening tin cans. Although this simple example of an accidental function seems innocent, damage caused by the screwdriver or the tin can's lid can be one of the results.

Users can also deliberately employ accidental functions for an evil purpose. Airplanes were designed to transport people over large distances. The 9/11 terrorists, however, used an airplane as an extreme weapon against Americans. It is almost impossible for a designer to foresee all the possible abuses of his or her design. Yet, designers should at least make a serious effort to think about possible abuses, rather than to take for granted that they can create a utopia in which no evil user exists. Such a utopia was sketched by Gene Roddenberry when he conceived his *Star Trek* television series. In *The Original Series*, the first series of this television show, we can see this very clearly. The *Enterprise* crew was tempted to respond to evil with evil, but they always

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exercised their good intentions, enabled by supportive technologies. But engineers do well not to assume this; rather, they should work from the assumption that there will always be someone who will use the device in unintended and evil ways.

An important aspect of this second type of imperfection has to do with our limited knowledge of the possible effects of new technologies. Not only has sin pervaded our intentions, but it has also affected our knowledge. This contributes to our limitations, in that we are creators and do not have the Creator's knowledge. This latter limitation, or epistemic opacity, carries with it a moral obligation to be careful in our decision making.³⁸ We can estimate the effects of a search for utopias only to a limited extent. Undesired side effects cannot be predicted. The greater the distance between the current situation and the desired utopia, the more we will be confronted with the Collingridge dilemma: the earlier in the process, the more we can decide, but the less we know about possible effects; the later in the process, the more we know but the less we can yet decide.³⁹ Many of the utopian ambitions we discussed are in a very early stage of realization. The tendency to give absolute priority to this realization can make people blind to possible undesired side effects. Instead, we should bear in mind the limitations of our knowledge. In addition, we have to take into account that, in the context of our ambitions, sin influences our knowledge in such a way that what we may hold to be true is that which we desire to be true.

Thus we need to develop "technologies for an imperfect world." This is what God calls us to do. Before Adam and Eve fell into sin, God called them to take care of a perfect garden. Cultivating this garden would have cost them no sweat, blood, or tears, since it would have naturally flourished. After sin, God spread a curse over the earth so that it brings forth thorns and thistles. Now cultivating the earth does cost sweat, blood, and tears. But this cultivation is still what God calls humans to do.⁴⁰ He wants us to take up the hoe and weed out the thorns and thistles, knowing full well that they will always come back.

We need not sit still and be silent until God restores everything. Until he comes back, he wants us to develop technologies that enable us to find shelter and food, to travel and communicate, to heal

the sick, and to help the blind to see and the lame to walk. But we have to keep in mind that in spite of all our efforts, what we accomplish is not his perfect future world. For that, we await his coming in glory. In the meantime, we set up imperfect and temporary signs of the eternal and perfect world that he will inaugurate at the end of history. The Bible begins with a perfect garden and ends with a perfect city. It is not the garden that will return, but, rather, a city which comes down from heaven. Granted, this is an image used in the Book of Revelation, but still it is an image that refers to technology and not just to nature. In this city, nature and technology are in perfect harmony. Trees grow unhampered in the presence of golden paving bricks.

In conclusion, responsible technology is technology that takes into account the imperfection of our current reality, rather than our striving for a human-made utopia. Building utopias is like erecting new towers of Babel. As Schuurman has pointed out, the intentions lying behind technological developments often are similar to those behind building this famous tower in the plain of Shinar.⁴¹ The motives for building these towers may seem morally good from a humanistic perspective. But from a biblical perspective, they do not do justice to the fact that God has given us only one way out of the impact of the curse that we have brought over this world, namely, reconciliation through Christ. Sixteenth-century church reformer John Calvin had a high appreciation for the culture developed by both Christians and non-Christians.⁴² However, he emphasized that our culture does not restore a lost paradise. Only God can and will bring into being the new perfect city that will replace the old perfect garden. Until then, we must gratefully use our capabilities to develop responsible technologies which weed the imperfect garden and build imperfect cities. ♦

Notes

¹There are, of course, also nontechnological utopias. Thomas More's *Utopia* (1516; reprint, Stilwell, KS: Digireads.com, 2005) was largely a political utopia.

²David Noble, *The Religion of Technology: The Divinity of Man and the Spirit of Invention* (New York: Penguin Books, 1999).

³Nonplace is the literal translation of the Greek word. I have used it here only in that sense and not in the way it is used by Marc Augé in his 1995 book called *Non-Places*. In that book, it has the meaning of places that we occupy so briefly that they lack significance as "places" for us.

- ⁴Alex Hall, "'A Way of Revealing': Technology and Utopianism in Contemporary Culture," *The Journal of Technology Studies* 35 (2009): 58–66.
- ⁵Mads Borup et al., "The Sociology of Expectations in Science and Technology," *Technology Analysis and Strategic Management* 18 (2006): 285–98.
- ⁶David Noble, *The Religion of Technology*.
- ⁷Alister E. McGrath, *A Life of John Calvin: A Study in the Shaping of Western Culture* (Oxford: Blackwell, 1990).
- ⁸Lynn Townsend White Jr., "The Historical Roots of Our Ecologic Crisis," *Science* 155 (1967): 1203–7.
- ⁹David Alexander, *Star Trek Creator: The Authorized Biography of Gene Roddenberry* (New York: Penguin Books, 1995).
- ¹⁰M. C. Roco and S. Bainbridge, *Societal Implications of Nanoscience and Nanotechnology* (Dordrecht, the Netherlands: Kluwer Academic Publishers, 2002); M. J. de Vries, "Analyzing the Complexity of Nanotechnology," in *Nanotechnology Challenges: Implications for Philosophy, Ethics and Society*, ed. Joachim Schummer and Davis Baird (Singapore: World Scientific, 2006), 165–79; M. J. de Vries, "A Multi-Disciplinary Approach to Technoethics," in *Handbook of Research on Technoethics*, ed. Rocci Luppini and Rebecca Adell (New York: Information Science Reference, 2008), 20–31.
- ¹¹Eric Drexler, *Engines of Creation* (New York: Anchor Press, 1986).
- ¹²Catherine Larrère, "Ethics and Nanotechnology: The Issue of Perfectionism," *HYLE – International Journal for Philosophy of Chemistry* 16 (2010): 19–30.
- ¹³See, for instance, Ray Kurzweil and Terry Grossman, *Fantastic Voyage: Live Long Enough to Live Forever* (Emmaus, PA: Rodale Books, 2004).
- ¹⁴Personally I am convinced that this refers both to the physical and spiritual death. In the context of evolutionary thinking, some theologians argue for physical death having been there from the beginning of human existence. The theological consequences of this in my view are, as yet, insufficiently analyzed.
- ¹⁵The idea of using science to control nature by technology goes back to Francis Bacon and his *Nova Atlantis* (1627).
- ¹⁶Henk Geertsema, "Cyborg: Myth or Reality," *Zygon* 41 (2006): 289–328.
- ¹⁷The first domain was medical technology.
- ¹⁸Sherry Turkle, *Life on the Screen: Identity in the Age of the Internet* (New York: Simon and Schuster, 1997).
- ¹⁹This holds, at least, for emotionally and spiritually healthy persons.
- ²⁰J. Dibbell, "A Rape in Cyberspace: How an Evil Clown, a Haitian Trickster Spirit, Two Wizards, and a Cast of Dozens Turned a Database into a Society," *Village Voice* (1993): 36–42.
- ²¹This concern was expressed by Cristina Botella et al., "Cybertherapy: Advantages, Limitations and Ethical Issues," *PsychNology Journal* 7 (2009): 77–100 in the context of psychotherapeutic use of virtual worlds; and by Tsung Juang Wang, "Educating Avatars: on Virtual Worlds and Pedagogical Intent," *Teaching in Higher Education* 16 (2011): 617–28 for educational use.
- ²²United Nations World Commission on Environment and Development, *Our Common Future* (Oxford: Oxford University Press, 1987).
- ²³William McDonough and Michael Braungart, *Cradle to Cradle: Remaking the Way We Make Things* (New York: North Point Press, 2002).
- ²⁴A dystopia is the opposite of a utopia.
- ²⁵This raises the question of whether the second law of thermodynamics is also the result of sin because of the effect of decay. I do not want to discuss that question here, but only point out that the decay is more than the effect of this law. It also has to do with the fact that humans display careless behavior in dealing with this garment.
- ²⁶Roger Paden, "Popper's Anti-utopianism and the Concept of an Open Society," *The Journal of Value Inquiry* 34 (2000): 409–26.
- ²⁷In the case of virtual worlds, we mentioned the possibility of identity problems, and in the case of sustainability, we mentioned the possibility of people creating waste in a careless way, assuming that all waste can be reused.
- ²⁸C. S. Lewis, *The Abolition of Man* (London: Oxford University Press, 1943).
- ²⁹Günther Anders, *Die Antiquiertheit des Menschen 1. Über die Seele im Zeitalter der zweiten industriellen Revolution* (München: C. H. Beck Verlag, 1956); and Günther Anders, *Die Antiquiertheit des Menschen 2. Über die Zerstörung des Lebens im Zeitalter der dritten industriellen Revolution* (München: C. H. Beck Verlag, 1980).
- ³⁰William McKibben, *The End of Nature* (New York: Random House Trade Paperbacks, 1989).
- ³¹See, for example, H. Achterhuis, *De erfenis van de utopie* (Amsterdam: Ambo, 1998).
- ³²Ibo van de Poel and Lambert Royakkers, *Ethics, Technology, and Engineering: An Introduction* (Chichester: Wiley-Blackwell, 2011).
- ³³Noble, *The Religion of Technology*.
- ³⁴Although the use of psychoactive drugs for psychiatric patients can be defended in certain cases, the dignity of the human personality should make us very guarded in this effort.
- ³⁵C. S. Lewis, *Mere Christianity* (London: Collins, 1952).
- ³⁶M. J. de Vries, "Technology for the Imperfect Life: The Development of Evil-Proof Technologies," in *Different Cultures, One World: Dialogue between Christians and Muslims about Globalizing Technology*, ed. Henk Jochemsen and Jan van der Stoep (Amsterdam: Rozenberg Publishers, 2010), 53–62.
- ³⁷M. J. de Vries, "Teaching About Technology," in *An Introduction to the Philosophy of Technology for Non-philosophers* (Dordrecht, the Netherlands: Springer, 2005).
- ³⁸Mark Coeckelbergh, "Imagining Worlds: Responsible Engineering under Conditions of Epistemic Opacity" in *Philosophy and Engineering: An Emerging Agenda* (Dordrecht: Springer, 2010), 175–87.
- ³⁹David Collingridge, *The Social Control of Technology* (New York: St. Martin's Press, 1980).
- ⁴⁰Jack Clayton Swearingen, *Beyond Paradise: Technology and the Kingdom of God* (Eugene, OR: Wipf & Stock Publishers, 2007), shows what this means in practice.
- ⁴¹E. Schuurman, *Faith and Hope in Technology* (Toronto, ON: Clements, 2003).
- ⁴²McGrath, *A Life of John Calvin*, 1990.

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