Templeton Science and Religion Series

In our fast-paced and high-tech era, when visual information seems so dominant, the need for short and compelling books has increased. This conciseness and convenience is the goal of the Templeton Science and Religion Series. We have commissioned scientists in a range of fields to distill their experience and knowledge into a brief tour of their specialties. They are writing for a general audience, readers with interests in the sciences or the humanities, which includes religion and theology. The relationship between science and religion has been likened to four types of doorways. The first two enter a realm of “conflict” or “separation” between these two views of life and the world. The next two doorways, however, open to a world of “interaction” or “harmony” between science and religion. We have asked our authors to enter these latter doorways to judge the possibilities. They begin with their sciences and, in aiming to address religion, return with a wide variety of critical viewpoints. We hope these short books open intellectual doors of every kind to readers of all backgrounds.

Series Editors: J. Wentzel van Huyssteen & Khalil Chamcham
Project Editor: Larry Witham
Technology and Religion

REMAINING HUMAN IN A CO-CREATED WORLD

Noreen Herzfeld

TEMPLETON PRESS
Contents

Preface vii

Chapter 1: Of Morals and Machines 3
   What Is Technology? 8
   The Idea of Creation 10
   Making High-Tech Choices 17

Chapter 2: Healing or Enhancing? 21
   Genetics, Stem Cells, and Cloning 22
   Pharmaceuticals 34
   Bionic Men and Women 45

Chapter 3: Cyberspace on Our Minds 56
   Human and Artificial Intelligence 57
   Playing Games in a Virtual World 69
   Relationships in Cyberspace 78

Chapter 4: The New Alchemy 91
   Nanotechnology 93
   Genetically Modified Crops 102
   Energy Technology 112
# vi : CONTENTS

| Chapter 5: Technology Goes Global | 125 |
| Religous Responses to Globalization | 130 |
| Relationship and Responsibility | 135 |

| Appendix | 141 |
| Notes | 145 |
| Index | 161 |
Preface

Technology is a rapidly changing field. Each day brings news stories of the development of new technologies. Yet the questions and concerns that surround these technologies are perennial. We ask today what is lost when our children turn to Facebook as a favored method of communication; a recent article in The Atlantic titled “Is Google Making Us Stupid?” questions whether the Internet is changing both the way we read and the way we think, making us less inclined to deep thought and reflection. Plato asked the same questions 2,500 years ago, addressing the then-new technology of the written word:

It will introduce forgetfulness into the soul of those who learn it: they will not practice using their memory because they will put their trust in writing, which is external and depends on signs that belong to others, instead of trying to remember from the inside, completely on their own. You have not discovered a potion for remembering, but for reminding; you provide your students with the appearance of wisdom, not with its reality. Your invention will enable them to hear many things without being properly taught, and they will imagine that they have come to know much while for the most part they will know nothing. And they will be difficult to get along with, since they will merely appear to be wise instead of really being so. (Phaedrus 275a–b)
The more things change, the more they stay the same.

Technology is also an extremely broad field. It is impossible in a single book to cover the gamut of new technologies and their implications for ourselves and our world. I have attempted in this volume to address a wide variety of technologies, dividing the field into three categories: technologies of the human body, technologies of the human mind, and technologies of the external environment.

I have written the bulk of this book while serving as a Fulbright scholar in Sarajevo, the capital of Bosnia and Herzegovina, a city that has historically inhabited the borderland between Christian West and Muslim East. As I type, I listen to bells from both Catholic and Orthodox cathedrals, ten minutes down the hill from my apartment, to be followed by the call of the muezzin from the five mosques I can see from my front porch. In the spirit of Sarajevo, I have considered the impact of our new technologies from Christian, Jewish, and Muslim perspectives. Many of the chapters of this book have been delivered as lectures at the Franciscan Seminary of Sarajevo and the Faculties of Philosophy and of Islamic Studies, both at the University of Sarajevo, and have benefited from comments and criticism from my students and fellow faculty members. I have also benefited from the insights of my colleagues at St. John’s University; I would like in particular to thank Fr. Roger Kasprick, Nick Hayes, Bernie Evans, Ernie Diedrich, and Chuck Rodell for sharing their expertise on particular sections.

Who are we as creative creatures fashioned in the image of a creator God? How can we best channel our creativity in order to serve God and our neighbor and to exercise responsible dominion over nature? What are our responsibilities in a rapidly globalizing world? The technologies examined in the following pages will continue to change. But the questions they force us to ask will remain.
Technology and Religion
Few technologies are simpler than a flashlight. But for rural Africa, the rechargeable flashlight—called a “solar”—has turned out to be a revolution. Much of Africa lacks sufficient electricity, and electricity is almost nonexistent in rural areas. In 2004, the United Nations estimated that only 20 percent of Africans (excluding Egypt and South Africa) have access to electricity, only 2 percent in most rural areas. This makes a flashlight a life saver. Peter Gatutoth, a Sudanese refugee, writes, “In case of thief, we open our solar and the thief ran away. If there is a sick person at night we will took him with the solar to health center.” In African homes, children rely on the solar to study for school at night. It replaces the wood, charcoal, and kerosene that smokes up huts and causes respiratory problems. Solar flashlights do not address the entire energy puzzle for Africans, but they do show how a small technology can improve a slice of African life and do so without disrupting the environment or family traditions.

China faces a similar power shortage for its rapidly industrializing and growing population. One solution to its energy crisis is a leviathan compared to distributing solar flashlights. On completion in 2009, the Three Gorges Dam on the Yangtze River will be the world’s largest producer of hydroelectric power. The dam’s thirty-four generators will pour out as much power as eighteen nuclear power plants. In all, China plans twelve such plants in the Yangtze basin. They are expected to reduce China’s heavy dependence on coal, currently the source of 67 percent of China’s electricity, and
thus reduce a chief source of pollution. Unlike a flashlight, however, the price for this electricity will be high for the nation’s traditions. As it approaches completion, Chinese officials admit that the Three Gorges Dam project may spawn more problems than it solves. Since its proposal, officials have known that the dam would displace a lot of people—1.3 million have already been relocated. It now appears that the dam will affect hundreds of thousands more. Ecological concerns abound. The dam seems to be destabilizing the surrounding hillsides, causing landslides and displacing farmers into higher regions, leading to further erosion. The reservoir will inundate villages and industrial sites, causing an accumulation of industrial toxins and human sewage in the water, pollutants previously flushed out by the moving river. The most lasting impact will be on the preservation of China’s long and illustrious history. As many as 1,300 archeological sites will disappear forever once the reservoir fills. And the beautiful scenery of the Three Gorges will be forever changed. The Three Gorges Dam is a triumph of technology and yet a harbinger of a new set of human misfortunes.

From Africa to China, technology reveals its benefits and its costs. What we hear about most are the benefits. Those who hold a stake in the development or dissemination of a new technology, the engineers and entrepreneurs, and the politicians and journalists they influence, tend to focus almost exclusively on the benefits, often resulting in a breathless sort of boosterism, a promise that the technological future will be nothing but rosy. According to this view, technology can solve most of our economic and social problems. Technology brings order to the chaos of the natural world. It is the key component of progress. One of the chief oracles of this gospel of progress is Bill Gates, the brilliant founder and ex-chairman of Microsoft. The world is “getting better,” he recently told world economic leaders. Women and minorities have advanced, life expectancy has skyrocketed, and more people have a democratic voice and freedom. According to Gates,
These improvements have been triggered by advances in science, technology, and medicine. They have brought us to a high point in human welfare. We’re really just at the beginning of this technology-driven revolution in what people can do for one another. In the coming decades, we’ll have astonishing new abilities: better software, better diagnosis for illness, better cures, better education, better opportunities and more brilliant minds coming up with ideas that solve tough problems.

Gates sees technology as the means to save the world. Like many who are uncritical of technology, he admits that current technologies have brought some social and economic challenges, yet he believes that solutions for these, and all other difficulties, can be found in further technological development.

Not all who are familiar with high-tech industry take as rosy a view. Bill Joy, the former CEO of Sun Microsystems, warned of the dangers of out-of-control technology in a 2000 *Wired* magazine article, “Why the Future Does Not Need Us.” Joy is particularly concerned about the rapid development and convergence of robotics, genetic engineering, and nanotechnology. To the shock of *Wired* readers, he called for a moratorium. As he says,

We are being propelled into this new century with no plan, no control, no brakes. Have we already gone too far down the path to alter course? I don’t believe so, but we aren’t trying yet, and the last chance to assert control—the fail-safe point—is rapidly approaching. . . . The experiences of the atomic scientists clearly show the need to take personal responsibility, the danger that things will move too fast, and the way in which a process can take on a life of its own. We can, as they did, create insurmountable problems in almost no time flat.
Like many who focus on the downside of modern technology, Joy sees only problems ahead. He asks the impossible, that societies on a global scale agree to give up the short-term benefits of several technologies in order to safeguard the future.

Between these two extremes—that technology is entirely beneficial or entirely detrimental—is a third stance that is equally problematic. This voice declares that technology is morally neutral. The surgeon and Jack the Ripper give the knife its good or evil role—in short, a machine does not have moral agency. As the National Rifle Association slogan goes, “Guns don’t kill people; people do.” While this seems like common sense, the claim of moral neutrality is not entirely true. Modern technology does possess a certain amount of agency. Consider, for example, robotics and artificial intelligence. While a robot is indeed programmed by a human being, it is impossible for that human to understand and foresee each action the robot will subsequently take.

While this might be considered an extreme example, the problem casts a wide net. In a conflict situation, the presence of “neutral” guns does, in fact, increase the likelihood of death. The abundance of technology may also override many of our human choices. The New England transcendentalist Henry David Thoreau, writing in his cabin by Walden Pond in 1854, lamented: “We do not ride on the railroad, it rides upon us.” Thoreau chose not to ride on the railroad, but he could not remove the railroad—visible from his rustic hovel—from his community nor turn the landscape back to how it was before the tracks were laid. Similarly, we are only now seeing the social and environmental costs of the American love of the automobile.

Beyond environmental changes, every new technology also displaces an older one, often making the older technology no longer available. As Muslim philosopher Muzaffar Iqbal recently noted, “I cannot travel on camel to go to the haj as my grandfathers used to do.” This lament could sound sentimental; few really wish to return to an earlier time. But the point is valid enough. The losses
caused by technology are usually seen only in retrospect, when we find that a new technology did not take into account all our values and intentions and the loss may be irreversible. For these reasons, technology is hardly a neutral matter. “It is a power endowed with its own peculiar force,” writes Jacques Ellul, a French philosopher who has shaped much of the modern debate over technology. “It refracts in its own specific sense the wills which make use of it and the ends proposed for it. Indeed, independently of the objectives that man pretends to assign to any given technical means, that means always conceals in itself a finality which cannot be evaded.”

Technology is here to stay. We have always been creators of technology, from the first hurling of a stone at an animal in order to produce lunch or the first rubbing of two sticks or striking of flint against stone to create and harness fire to cook that lunch. We cannot escape technology. Yet we also should not blindly espouse every technology that comes down the pike. To choose which technologies serve us well and which do not, we need a way to assess them critically. The assessment must look at both the tool itself and the society in which it will be used. That, in turn, will require a clear grasp of who we are as individuals and societies and the values that we want to live by. This is where religion, a chief source of our cultures and values, plays an essential role in our discussion of technology.

Our religious communities preserve the wisdom of our forebears on questions of who we are and what we value. They also provide a locus for discussion in the context of worldwide communities of faith. Like technology, religion is also here to stay, despite the predictions of early twentieth-century intellectuals—Karl Marx, Sigmund Freud, Friedrich Nietzsche—to the contrary. In fact, as our devotion to science and technology grows, so it seems does our religious devotion. In the U.S., three times as many people regularly attend religious services today as compared to when the nation was founded. Technology and religion are growing hand in
手。手和人脑都形成我们的世界观，我们对世界的理解，我们的位置和未来轨迹。因此，看两者是一致的。

**What Is Technology?**

技术只有一个目的——改变世界，改变我们自己或我们的环境。通过技术，我们寻求保持自身和环境的安全，使我们的生活更长更舒适。然而，现代技术超越了这个防御性角色。通过基因工程或纳米技术，我们不仅寻求使我们的生活更安全和更容易，还寻求创造全新的东西，在《星际迷航》术语中，“去其他人从未去过的地方。”

技术这个词来自希腊语techne，意为工艺、艺术或知识。换句话说，techne不仅关于工具。技术不仅仅是我们在生产食物、衣物和居所中使用的机器、化学物质或仪器，还包括我们使用的技巧、过程和方法。但这些过程并不孤立存在。技术和我们使用它们的社会有很大关系，而技术本身也是在社会中发展起来的。因此，techne有三个组成部分——工具、过程和一个社会背景。

乍一看，techne和现代技术似乎非常相似，但现代技术与古人的techne有很大的不同。社会批评家尼尔·波兹曼在他的著作《technopoly：文化对技术的投降》中强调了这种区别。他说，现代西方文化在“将技术神化，也就是说，文化寻求在技术中获得授权，在技术中找到满足，在技术中接受命令。”

古人的工具解决了生产食物、衣物和居所中面临的紧迫问题。它们帮助我们的祖先生存，但没有在理解世界和他们自己方面起主要作用。
These tools were not central to the thought world of the Greeks. In today’s world, technology is central to our understanding of ourselves and the environment around us. Postman believes technology has, in fact, come to monopolize that understanding. Given the tremendously large role religion and religious identity still play in the modern world, I would suggest that our technological worldview has no monopoly but stands together, sometimes in tension, sometimes in harmony, with our religious understandings. But technology plays an undeniably greater role in our lives than it has at any previous time in human history.

That greater role is also seen in the power to create something new, a quest that was less prominent in ancient techne. To create the new is to go outside of nature. In his essay “The Question concerning Technology,” the German existentialist Martin Heidegger observes that the ancient craftsman certainly made something new when he constructed a chair. A doctor might bring new health to a patient. However, neither imposed a new form on nature; rather, each worked with what is already implicit in the wood or the body. The wood of the chair is still wood and will rot just as would a log in the forest. The body returns to the natural healthy condition.

In contrast, a genetically engineered human or a chimera that is half sheep and half goat is outside of its natural order. By its genetic alteration, the “geep” will never again produce a sheep or goat. Humanly extracted plutonium never returns to the uranium from which it was derived. The new products of modern technology do not simply “disclose” or shape nature but transform and replace nature. In this way, modern technology gives us heretofore undreamed of power.

Faced with these prospects, it behooves us to bring the best of our wisdom to bear in selecting and using technologies. The French thinker Ellul, a critic of what he calls the modern technological tyranny, has composed a list of “76 Reasonable Questions to Ask about Any Technology” (see appendix). The list includes ecological, social, practical, moral, ethical, vocational, metaphysical,
political, and aesthetic considerations. They are insightful questions, and well worth consideration. But few are likely to take the time to consider such an extensive list. Rather than add a tenth category of religious questions, we can find in our religious traditions a shorter list of more general concerns, a list that subsumes many of Ellul’s categories.

THE IDEA OF CREATION

A commonality in how the monotheistic faiths—Judaism, Christianity, and Islam—approach technology springs from the book of Genesis, where the human project is so poetically introduced. In the first chapters of this book, we find two stories of creation. These stories attempt to teach a basic understanding of who we are as humans and what our place is in relationship to the rest of the created world. They are also stories about the act of creation, of bringing order out of chaos, and technology is at root a creative activity, one that brings order to the material world. Thus, there is no better place to begin a consideration of technology in a religious light than “in the beginning.”

The creation of human beings is described in Genesis 1:26–28:

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