Predictions for the 21st Century

From our 2015 vantage point, let's look back at predictions made in 1999 about trends which would shape this century. Although far from the end of this century, we can make a preliminary assessment of these predictions. Were they on the right track or are they already veering from current reality?

For this exercise, we drew on predictions made by seventeen scholars in 1999, published in First Things: A Monthly Journal of Religion and Public Life.{1} They discussed what they were expecting in this next century.



Past vs. Future

Some of the scholars took the approach of looking at prior centuries to see what they could learn to help them predict future trends.

Writer Charlotte Allen{2} began by stating, "Palm-reading the lifestyles of the future usually sets you up to be proved wrong," and looked at the last two millennia to prove her point. First, someone predicting the future in the year 1 BC would probably talk about the Roman Empire and how it was entrenched and likely to remain the dominant power. But, of course the big event of the millennium was the beginning and growth of Christianity, still impacting our world today, while the Roman Empire is only a memory. Then she notes that the future of European civilization looked grim in the year 1000, but "it turned out to be the century of European expansion and great advances in science and economics."

Looking ahead, she had a fairly negative outlook for the West: “The combination of the new people and a fading sense of common values seems to spell disaster . . .” But on a worldwide scale, she saw us trending toward a great religious revival, the same trend that changed the outcomes of the previous two millennia.

Assessing her forecast today, we continue to see a fading sense of common values in our society and can only hope that a great religious revival will occur.

Another forecaster, political scientist Andrew Bacevich,{3} sees Americans becoming very self-centered in their view of the world. At the beginning of the last century, Woodrow Wilson brought in the idea of American global preeminence. At the end, Bill Clinton modified this sentiment to, “the allure of globalization lies in . . . the promise of gain without pain.” Bacevich believes this attitude of taking advantage of our position in the world order will continue to grow throughout this century.

However, now President Obama has brought a new idea—denying that America should be globally preeminent but rather, just one of many nations, an idea offering the promise of pain without gain. We suffer the pain of conflict with no real expectation of gaining greater respect for democracy.

The Role of Religion

One area of interest in 1999 predictions is how the role of Christianity may change. Three of our forecasters touched on this subject.

Physicist Stephen Barr{4} believed little progress will be made in answering top questions of science. Questions such as “What is consciousness, and how does it fit into . . . the physical world?” However, he believed we will make strides reconciling science and religion. He stated, “For many, the

scientific spirit came to be defined in opposition to faith. This hostility . . . really involves an inner contradiction that is coming to the surface." It would become clear to most scientists that there is more to this existence than physical science. "By proclaiming the truth about man, religion will be found to be not an enemy of reason, . . . but perhaps its last defender."

Theologian Peter Leithart{5} believed this century will see the West becoming the primary mission field for Christians from places like South Korea. He wrote, "The same nations swearing fealty to Christ a millennium ago are now among the most secular on the earth." Success in the West may only come after the current situation is reduced to rubble through removing the constraints once held in place by common Christian values. In which case, "the West will have to relearn the habits of Christian civilization from those once considered barbarians."

Psychiatrist and author Jeffrey Satinover{6} believed the teachings of the Third Reich are prevailing over the teachings of Christ. "Mercy killing, abortion, infanticide, [all] once seen as repulsive has been transformed into . . . beauty." He sees our best universities focused on teaching a perverted view of fairness. "The American mind isn't just being closed, it's being evacuated," i.e., filled with inconsistent thinking. The system which should be promoting truth and protecting us from such politically correct drivel is religion. As he pointed out, "God Himself is doing just fine, but His earthly defenders are on the ropes . . . [after all] genuine religion claims for itself the ability to know what's true," and yet we are not proclaiming or defending truth. Without the broader truth of Christianity, we may lose our identities completely.

Three very different pictures were forecast. One, optimistically, believes religion will be the last defender of reason, while another believes our hope lies in becoming a

mission field, and a third worries that Christianity may be discarded. Fifteen years into this millennium, it appears the latter two are closer to the trajectory of society, but the optimistic view is still a possibility when fueled by the prayers of believers.

Key Drivers in this Century

Some predictions made in 1999 about this century deal with the underlying forces shaping this century.

Philosopher and theologian William Dembski{7} predicted that "information is the primary stuff of the coming age." In the last century, the computer helped introduce an age where the amount of information we were able to use increased dramatically. But information may be far more fundamental in this universe. Should information be regarded as "a basic property of the universe, alongside matter and energy"? In other words, rather than information being something created by man, it may be a primary contributor to the creation and being of the universe.

Information as a driving factor of the material universe helps us to understand how our conscious thoughts are a part of it as well. As Dembski quotes physicist Paul Davies, "If matter turns out to be a form of organized information, then consciousness may not be so mysterious after all."

Why is this concept important to religion and faith? If information is not primary, the world is seriously hampered in what it can reveal. We've seen this with the rise of modern science revealing nothing about God except that God is a lawgiver. But if information is the primary stuff, then there are no limits whatsoever on what the world can in principle reveal.

However, another prognosticator, journalist Hilton Kramer,{8} warned that dealing with the deluge of information will be a

critical factor in maintaining a healthy life and society in this century. He stated, “All the portents point to an acceleration of the merry, mindless, technology-driven surrender to the complacent nihilism that has already overtaken so many of the institutions of cultural life. . . our democratic society has lost the power to protect . . . from the evil effect of this cultural imperative.” The sea of information has the effect of removing the idea of a standard of truth for righteous living. With so many competing standards vying for their attention, many have given up on pursuing any concept of truth. This thinking has a devastating effect on life based upon Jesus, the one who said, “For this reason I was born . . . to testify to the TRUTH.” (John 18:37) For the church, “everything will depend on its ability to marshal a principled resistance to the influence of popular culture” and the sea of inconsistent information.

One sixth of the way through this century, we see both the importance of information as a fundamental force and the difficulty we have dealing with the vast amount of information constantly vying for our attention. Both of these forecasts are continuing along a path to fruition in this century.

Relating to Religion

Let’s consider next the perversion of tolerance and the future of ecumenism.

Author Glenn Tinder{9} posited that the meaning of tolerance had shifted from “a willingness to put up with the characteristics of others” to a distinctly different stand “that all beliefs should be considered equally true, except for any belief that states your beliefs are correct and another’s are wrong.” He wrote, “Tolerance easily becomes acquiescence in the submergence of truth into a shifting variety of opinions. . . [this view] cannot be acceptable to . . . Christians . . . challenged . . . to develop an attitude toward the religious and cultural confusions surrounding them

that is tolerant" in a way that is distinct from today's new tolerance.

Tinder suggested using the term "forbearance," reflecting a view imbued with brotherly love, a recognition of a diversity of views, and an understanding that one should speak out for the truth as one knows it. "In an era that says to us every day, 'there is no Truth,' the art of forbearance might at least help us resist the temptations of relativism."

In 2015, the post-modern definition of tolerance continues to hold sway. But a discernible trend to use another term to describe the loving attitude Christians have toward others has not appeared. The fight against promoting any set of ideas as equally valuable is continuing but with no discernible progress.

Princeton University law professor Robert George{10} looked back to the Second Vatican Council in 1965 when many mainline Protestants and Catholics were wondering if it were a precursor to ultimate reunification of the Christian Church. Surprisingly, by 1999 it was not the left talking of ecumenicalism, but rather the religious right. The consistency of moral positions in the Catholic Church and in evangelical circles had blossomed into a genuine spiritual engagement.

"How can there be genuine spiritual fellowship between people who sincerely consider each other to be in error on profoundly important religious questions?" George suggested it was genuine because it took religious faith and religious differences seriously.

Their common goal of combatting the increasing rise of non-Christian thought would cause them to work together. He stated, "I am even hopeful of its capacity to survive victories—though that of course is the far greater challenge."

Today, in 2015, cooperation continues between conservative

Catholics and evangelicals on moral issues in our world. Some Catholic and evangelical leaders released the Manhattan Declaration calling for the sanctity of human life, the dignity of marriage, and freedom of religion. And, in 2011, the organization, Evangelicals and Catholics Together, released a statement supporting religious liberty.

What Rules Our World

We have been looking at predictions made for this century in 1999 about factors that would rule our world situation today and in the future.

Theologian Paul Griffiths{11} noted that at the end of the first millennium, the primary institutional form was the church. During the second millennium, it was joined by the nation-state and corporations. Entering the third millennium, "the forces . . . are now primarily economic and secondarily political" with the churches existing at the margin of society.

He predicted the significance of corporations will advance as nation-states decline, making us a world not defined by what we believe, but by what we consume. Hopefully "as the bankruptcy . . . of the corporate promise begins . . . to become evident, people turn . . . to the churches with renewed passion." To become anything other than a religious preference box on a census form, churches must look to provide a message that offers a hope of resistance.

Today, we are more driven by consumption. Time will tell if Griffiths is right and this trend will ultimately lead us back to the church with renewed passion.

Legal scholar Robert Bork{12} predicted the "rule of law" will no longer have independent moral force of its own. Bureaucracies will lay down most of what governs with little accountability to the people. Elections and legislative

deliberation will be disconnected from the real governance, making politics simply entertainment. “Democracy will consist of the chaotic struggle to influence decision makers who are not responsive to elections.”

Today, we are seeing the President and bureaucracy taking away the legislative authority of the Congress. If anything, this process seems to be picking up steam in the first half of 2015. If this trend remains unchecked, Bork’s prediction will come to fruition.

Francis Cardinal George{13} foresaw a major shift in the forces of global conflict. Where most conflicts were between states, in this new century we will see the clash between modern Western states, Asian civilizations and Islamic civilization. Uncertainty about the intentions of other civilizations will produce fear between them. For example, the post-modernity of the West directly attacks the pre-modern, faith-based culture of the Islamic societies.

George felt Christians should be open to Muslim cooperation in “addressing the moral failures of modernity.” The church could take the lead in creating a “globalization of solidarity.”

So far in this century, the clash between the West and Islamic civilizations is at the forefront of world relationships with no significant signs of a breakthrough in understanding or compromise.

Looking back over the last fifteen years, many of these predictions from 1999 are roughly on track. These pundits did not paint an encouraging view of the future. It is incumbent on evangelicals to pray fervently and work diligently to change western society for Christ over the next 85 years.

Notes

1. First Things: A Monthly Journal of Religion and Public Life.

2. Charlotte Allen, “What Can We Reasonably Hope For,” www.firstthings.com/article/2000/01/what-can-we-reasonably-hope-for-110. Accessed July 26, 2015.

3. Andrew Bacevich, “What Can We Reasonably Hope For,” www.firstthings.com/article/2000/01/what-can-we-reasonably-hope-for-47. Accessed July 26, 2015.

4. Stephen Barr, “What Can We Reasonably Hope For,” www.firstthings.com/article/2000/01/what-can-we-reasonably-hope-for-23. Accessed July 26, 2015.

5. Peter Leithart, “What Can We Reasonably Hope For,” www.firstthings.com/article/2000/01/what-can-we-reasonably-hope-for-26. Accessed July 26, 2015.

6. Jeffrey Satinover, “What Can We Reasonably Hope For,” www.firstthings.com/article/2000/01/what-can-we-reasonably-hope-for-2. Accessed July 26, 2015.

7. William Dembski, “What Can We Reasonably Hope For,” www.firstthings.com/article/2000/01/what-can-we-reasonably-hope-for-111. Accessed July 26, 2015.

8. Hilton Kramer, “What Can We Reasonably Hope For,” www.firstthings.com/article/2000/01/what-can-we-reasonably-hope-for-113. Accessed July 26, 2015.

9. Glenn Tinder, “What Can We Reasonably Hope For,” www.firstthings.com/article/2000/01/what-can-we-reasonably-hope-for-28. Accessed July 26, 2015.

10. Robert George, “What Can We Reasonably Hope For,” www.firstthings.com/article/2000/01/what-can-we-reasonably-hope-for-22. Accessed July 26, 2015.

11. Paul Griffiths, “What Can We Reasonably Hope For,” www.firstthings.com/article/2000/01/what-can-we-reasonably-hope-for-1. Accessed July 26, 2015.

12. Robert Bork, "What Can We Reasonably Hope For," www.firstthings.com/article/2000/01/what-can-we-reasonably-hope-for-14. Accessed July 26, 2015.

13. Francis Cardinal George, "What Can We Reasonably Hope For," www.firstthings.com/article/2000/01/what-can-we-reasonably-hope-for-3. Accessed July 26, 2015.

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"How Do We Know Eyewitnesses to Jesus' Ministry Ever Existed?"

I came across your website and looking for first-hand eyewitness evidence of Jesus' ministry. I wish to quote a line you wrote:

> *In the early years of the church the story of Jesus was being told and retold by eyewitnesses of these events.*

My question is, where are the original source documents that cite (at least some of) these eyewitnesses? Many Christian apologetics claim that there were many eyewitnesses to the ministry of Jesus. The question is, what evidence do we have that such eyewitnesses even existed?

Thanks for your question; it's a good one. My first observation may sound a bit silly, although I don't intend it to be so. But when I think about it, if there were no

eyewitnesses to Jesus' ministry, if literally no one witnessed anything of his teachings, miracles, etc., then it seems that we would simply have no record of these events at all (for no one would have witnessed them). But in fact, conservative scholars agree that we have a great deal of eyewitness testimony recorded in the New Testament documents themselves. For instance, the gospels of Matthew and John were written by two of Jesus' original disciples. So both of these gospels are based on eyewitness testimony. Early church tradition claims that Mark's gospel was based on the preaching of the apostle Peter (another eyewitness of Jesus' life and ministry). And Luke's gospel begins by noting the importance of eyewitness testimony to the ministry of Jesus:

Luke 1:1-4 says,

> *Many have undertaken to draw up an account of the things that have been fulfilled among us, just as they were handed down to us by those who from the first were eyewitnesses and servants of the word. Therefore, since I myself have carefully investigated everything from the beginning, it seemed good also to me to write an orderly account for you, most excellent Theophilus, so that you may know the certainty of the things you have been taught.*

In addition, Peter (in his second epistle) wrote: "We did not follow cleverly invented stories when we told you about the power and coming of our Lord Jesus Christ, but we were eyewitnesses of his majesty."

Similarly, the apostle John begins his first letter this way:

> *That which was from the beginning, which we have heard, which we have seen with our eyes, which we have looked at and our hands have touched—this we proclaim concerning the Word of life. The life appeared; we have seen it and testify to it, and we proclaim to you the eternal life, which was with the Father and has appeared to us. We proclaim to you what we*

> *have seen and heard, so that you also may have fellowship with us. And our fellowship is with the Father and with his Son, Jesus Christ (1 John 1:1-4).*

Finally, Paul writes of seeing Jesus after his resurrection: “Am I not free? Am I not an apostle? Have I not seen Jesus our Lord? Are you not the result of my work in the Lord?” (1 Corinthians 9:1)

These are just a few examples. Others could be offered as well. But these are sufficient (I think) to show that the earliest records we have of the life and ministry of Jesus claim to be solidly grounded in eyewitness testimony.

I hope this is helpful.

Shalom in Christ,

Michael Gleghorn
Probe Ministries

Thank you for your reply, and I thank you for your efforts to answer my question. I appreciate that you took time out of your life to answer it.

However, what I am really after is a list of non-Biblical sources that back up the Biblical sources. If the events of Jesus really happened, it would be logical to assume that there would be plenty more writings of this event. Well, this would at least appear logical in my mind.

I know there were at least two historians, Josephus and Tacitus, and also the Jewish writings of the Talmud. Why did these historians and sources only write a small amount? If Jesus really did turn water into wine, or fed 5,000 with two fishes, then this would attracted an incredible amount of attention.

It appears to me, and perhaps you can shed some light on this

matter, that Christianity begun as a political movement whose ulterior motive was social control. It is only the fear of Hell that ultimately connects people to the Christian view, including mine.

Anyway, any correspondence would be appreciated. I'm not trying to debate you, but seek earnestly for answers.

Good questions! I've written a brief article which deals with some of the evidence you're asking for. You can find it here.

One of the best book-length treatments that I'm aware of is Gary Habermas's *The Historical Jesus: Ancient Evidence for the Life of Christ.*.

Other helpful resources would be Lee Strobel's *The Case for Christ*, Craig Evans' *Fabricating Jesus*, and Robert Bowman and J. Komoszewski's *Putting Jesus in His Place*.

Finally, I would highly recommend the articles dealing with the Historical Jesus by William Lane Craig, which you can find here.

These recommendations are all of high quality (some popular, some scholarly).

It's important to understand that the New Testament documents are our earliest and best sources of information about Jesus. Many people don't realize this, but it's a fact that even liberal scholars don't dispute. The New Testament was not originally written as a single volume. Rather, each book is an independent source of information about Jesus and early Christianity. In other words, what we have in the New Testament is not one source, but rather twenty-seven sources. Granted, many of these sources are authored by one individual (the apostle Paul), but my point is that these documents were originally separate, independent, sources of information. That's an important point to bear in mind.

After the New Testament documents (and assuming you don't include early Christian sources outside the Bible), the earliest non-Christian testimony about Jesus that survives is that of the Jewish historian, Josephus (near the end of the first century). After Josephus, there is Tacitus (a Roman historian) and so on. Three things must be borne in mind here:

1. Most of the written sources from the first and second centuries are simply lost to history. Only a fraction of what was written at this time survives to our own day. Thus, there could have been other sources of information about Jesus which are simply not available to us 2000 years later.

2. It's really not strange that more non-Christian sources don't record information about Jesus. After all, Jesus was a poor Jewish teacher who spent most of his time outside Jerusalem. Since most non-Christian historians of that time focused their writings on great political figures, military leaders, etc., it's really not surprising that they wouldn't mention someone like Jesus. Indeed, what's actually surprising is that he IS mentioned by Josephus, Tacitus, etc. My point is this: Although Jesus is a hugely significant figure today, he was little known in the first century. The church is a worldwide phenomenon in our day, but it began as a very small offshoot of the Jewish religion. We shouldn't think that Jesus' name was a household term in the ancient world like it is today. The spread of Christianity took place over many centuries and continues today.

3. The Gospels (and other New Testament documents) should not be immediately discounted as reliable historical sources of information about Jesus. As I said, these are our earliest and best sources about Jesus. What's more, we have good reason to consider these sources as reliable sources of information about Jesus. In addition to the resources recommended previously, see also Craig Blomberg's *The Historical Reliability of the Gospels*.

Finally, I can only give a very brief response by email. Please be sure to check out some of the resources I've recommended above.

Michael Gleghorn

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"Who Do You Think You Are to Decide What is Real in the Angel World?"

I don't know much about you or your Probe organization, however I read the information you passed off as truth regarding knowledge of angels and how you interpret the posers [editor's note: maybe she means "possessors"?] **of angel knowledge as being from some pit of hell. Where did you get such authority to decide who is real and who is not in God's world? Did he come to you and instruct you personally on these matters or is this simply your opinion? I don't doubt you are educated in your field, yet the angry tone of your paper left me feeling you are in need of some relaxation and spiritual healing—maybe a retreat would help you to gain some insight into the fact that perhaps you are not the ultimate authority on God and his angels. I do believe in angels and have had many situations in my life where their presence is known to me in a number of ways. If I am open to receive the wisdom and have faith that God is watching over me, his angels surround me every moment of the day. The soul or spirit of a human being was created by the Divine and to think that I have the corner on God's messengers' existence and how to tell what is which would really be giving me—a mere mortal—an extremely**

heavy cross to bear. God loves you, Sue. Try to remember He is constantly revealing more to us on a daily basis. If your beliefs are so rigid, you may be missing the ever changing delight in experiencing this thing called life we are all in together! Judge not, lest ye be judged and may his angels help you to understand that God speaks to all of us differently. A fallen angel is one who thought he knew it all (Satan) and his ego got him banished. If you have to condemn people on your web page, you are becoming dangerously close to closing out the Light. Smile.

Thanks for writing.

> *Where did you get such authority to decide who is real and who is not in God's world? Did he come to you and instruct you personally on these matters or is this simply your opinion?*

Perhaps someone edited the version you saw, but the one I wrote was filled with scripture references. My authority is not my opinion but the Word of God. Who better to teach me—and anyone else who wants to learn—about God and angels than God Himself, through His Word?

> *I don't doubt you are educated in your field, yet the angry tone of your paper left me feeling you are in need of some relaxation and spiritual healing—maybe a retreat would help you to gain some insight into the fact that perhaps you are not the ultimate authority on God and his angels.*

I appreciate your good wishes for me; however, the angry tone you see in my article must have been on the receiving end since there's no reason to be angry about this subject, nor was I angry when I wrote it. I do not claim to be the ultimate authority of God and His angels, but I do claim that the Bible IS the ultimate authority, and all I did was go to the Bible to find out what God said, and then relate it to our

experiences and what people teach today.

I am so glad there is an ultimate authority outside myself. What is your authority? Is it your personal opinion and experience? If that's the case, how do you know it's true? How do you know you're not being deceived?

> *I do believe in angels and have had many situations in my life where their presence is known to me in a number of ways. if I am open to receive the wisdom and have faith that God is watching over me, his angels surround me every moment of the day.*

Me too. However, the Bible says there are two kinds of wisdom, heavenly wisdom and earthly wisdom. How do you know which kind you are receiving? I can compare the wisdom I receive to God's word and know if it's true, or a lie sent to me by "ugly angels." How do *you* tell the difference between the two kinds of wisdom?

> *The soul or spirit of a human being was created by the Divine and to think that I have the corner on God's messengers' existence and how to tell what is which would really be giving me—a mere mortal—an extremely heavy cross to bear.*

You're right, which is why I rely on the Bible and not my own opinion.

> *God loves you, Sue. Try to remember He is constantly revealing more to us on a daily basis.*

I do experience His leading on a daily basis, but there's a difference between this personal leading and the revelation of new truth, which ended when the Biblical canon was closed. When people say that God is revealing new truth, red flags go up for me because that truth often contradicts what He's already said in His Word. And THAT is the authority for

judging this “truth” and “revelation.” Failing to compare this “revelation” is what makes us vulnerable to the lies of Satan and the demons.

> *If your beliefs are so rigid, you may be missing the ever changing delight in experiencing this thing called life we are all in together! Judge not, lest ye be judged*

Hmmmm. . . . without knowing me, you have judged my experience of life and called my beliefs rigid because I am confident of their basis in God’s word. Please remember that words on a screen or on a page are only part of the story, and your perception of what I (or any other writer) say is filtered through your own beliefs and presuppositions.

> *and may his angels help you to understand that God speaks to all of us differently.*

The Bible tells me that it is the Holy Spirit who teaches God’s people, not angels. If you’re listening to angels’ teachings of “understanding,” how can you be sure you are listening to holy angels and not unholy angels? And if “God speaks to all of us differently,” what do you do with contradicting messages? They can’t all be right. Somebody’s lying somewhere in the spirit realm. That’s one of the major points of my article. We are lied to on a regular basis by fallen angels who hate us and want to lead us astray. How do you know which ones they are unless you depend on God’s Word instead of your own experience and opinion?

> *A fallen angel is one who thought he knew it all (Satan) and his ego got him banished. If you have to condemn people on your web page, you are becoming dangerously close to closing out the Light. Smile.*

There’s a difference between condemning people, and condemning false teaching and the demonic powers behind it. I hope you

can develop the discernment to tell the difference.

Thank you for sharing your concerns with me. I pray God will open your eyes to the truth and you will hear His call to be careful about communication with angels, lest you be led astray.

The Lord bless you and keep you.

Sue Bohlin

Probe Ministries

Technological Challenges of the 21st Century

We live in historic times. And we will face new challenges as we enter the 21st century, especially in the area of technology. The fields of biotechnology and information technology have the capacity to change the social landscape and even alter the way we make ethical decisions. These are not challenges for the faint-hearted. We must bring a tough-minded Christianity into the 21st century.

We are reminded in 1 Chronicles 12:32 (NIV) that the men of Issachar "understood the times and knew what Israel should do." Likewise, we must understand our times and know what we should do. New ethical challenges await us as we consider the moral issues of our day and begin to analyze them from a biblical perspective.

We should also enter into the task with humility. Over a hundred years ago, Charles Duell, Director of the U.S. Patent Office, was ready to close his office down because he believed

that “Everything that can be invented has been invented.”{1} We should not make the mistake of thinking that we can accurately see into the future. However, we can analyze trends and look at new inventions and begin to see the implications of these remarkable changes. Our challenge will always be to apply the timeless truths of Scripture to the quickly changing world around us.

How should Christians analyze the technological changes taking place? First we must begin by developing a theology of technology.

Theology of Technology

Technology is really nothing more than the systematic modification of the environment for human ends. This might be a process or activity that extends or enhances a human function. A telescope extends man’s visual perception. A tractor extends one’s physical ability. A computer extends a person’s ability to calculate.

The biblical mandate for developing and using technology is stated in Genesis 1:28. God gave mankind dominion over the land, and we are obliged to use and manage these resources wisely in serving the Lord. God’s ideal was not to have a world composed exclusively of primitive areas. Before the Fall (Gen. 2:15) Adam was to cultivate and keep the Garden of Eden. After the Fall the same command pertains to the application of technology to this fallen world, a world that “groans” in travail (Rom. 8:22). Technology can benefit mankind in exercising proper dominion, and thus remove some of the effects of the Fall (such as curing disease, breeding livestock, or growing better crops).

Technology is neither good or evil. The worldview behind the particular technology determines its value. In the Old Testament, technology was used both for good (e.g., the building of the ark, Gen. 6) and for evil (e.g., the building

of the Tower of Babel, Gen. 11). Therefore, the focus should not be so much on the technology itself as on the philosophical motivation behind its use. Here are three important principles that should be considered.

First, technology should be seen as a tool, not as an end in itself. There is nothing sacred about technology. Unfortunately, Western culture tends to rely on it more than is appropriate. If a computer, for example, proves a particular point, people have a greater tendency to believe it than if the answer was a well-reasoned conclusion given by a person. If a machine can do the job, employers are prone to mechanize, even if human labor does a better or more creative job. Often our society unconsciously places machines over man. Humans become servants to machines rather than the other way around.

There is a tendency to look to science and engineering to solve problems that really may be due to human sinfulness (wars, prejudice, greed), the fallenness of the world (death, disease), or God's curse on Adam (finite resources). In Western culture especially, we tend to believe that technology will save us from our problems and thus we use technology as a substitute for God. Christians must not fall into this trap, but instead must exhibit their ultimate dependence on God. Christians must also differentiate between problems that demand a technological solution and ones that can be remedied by a social or spiritual one.

Second, technology should be applied in different ways, according to specific instructions. For example, there are distinctions between man and animal that, because we are created in God's image (Gen. 1:26-27), call for different applications of medical science. Using artificial insemination to improve the genetic fitness of livestock does not justify using it on human beings. Christians should resist the idea that just because we *can* do something, we *should* do it. Technological ability does not grant moral permission.

Third, ethics, rather than technology, must determine the direction of our society. Jacques Ellul has expressed the concern that technology moves society instead of vice versa.{2} Our society today seems all too motivated by a technological imperative in our culture. The technological ability to do something is not the same as a moral imperative to do it. Technology should not determine ethics.

Though scientists may possess the technological ability to be gods, they nevertheless lack the capacity to act like gods. Too often, man has tried to use technology to become God. He uses it to work out his own physical salvation, to enhance his own development, or even to attempt to create life. Christians who take seriously human fallenness will humbly admit that we often do not know enough about God's creation to use technology wisely. The reality of human sinfulness means that society should be careful to prevent the use of technology for greed and exploitation.

Technology's fruits can be both sweet and bitter. C. S. Lewis writes in the *Abolition of Man*, "From this point of view, what we call Man's power over Nature turns out to be power exercised by some men over men with Nature as its instrument. . . . There neither is nor can be any simple increase of power on Man's side. Each new power won *by* man is a power *over* man as well. Each advance leaves him weaker as well as stronger. In every victory, besides being the general who triumphs, he is also the prisoner who follows the triumphal car."{3}

Christians must bring strong biblical critique to each technological advance and analyze its impact. The goal should be to liberate the positive effects of technology while restraining negative effects by setting up appropriate constraints against abuse.

The Challenge of Biotechnology

The age of biotechnology has arrived. For the first time in

human history it is possible to completely redesign existing organisms, including man, and to direct the genetic and reproductive constitution of every living thing. Scientists are no longer limited to breeding and cross-pollination. Powerful genetic tools allow us to change genetic structure at the microscopic level and bypass the normal processes of reproduction.

For the first time in human history it is also possible to make multiple copies of any existing organism or of certain sections of its genetic structure. This ability to clone existing organisms or their genes gives scientists a powerful tool to reproduce helpful and useful genetic material within a population.

Scientists are also developing techniques to treat and cure genetic diseases through genetic surgery and genetic therapy. They can already identify genetic sequences that are defective, and soon scientists will be able to replace these defects with properly functioning genes.

Gene splicing (known as recombinant DNA technology) is fundamentally different from other forms of genetic breeding used in the past. Breeding programs work on existing arrays of genetic variability in a species, isolating specific genetic traits through selective breeding. Scientists using gene splicing can essentially "stack" the deck or even produce an entirely new deck of genetic "cards."

But this powerful ability to change the genetic deck of cards also raises substantial scientific concerns that some "sleight-of-hand" would produce dangerous consequences. Ethan Singer said, "Those who are powerful in society will do the shuffling; their genes will be shuffled in one direction, while the genes of the rest of us will get shuffled in another."{4} Also there is the concern that a reshuffled deck of genes might create an Andromeda strain similar to the one envisioned by Michael Crichton is his book by the same

title.{5} A microorganism might inadvertently be given the genetic structure for some pathogen for which there is no antidote or vaccine.

The potential benefits of gene splicing are significant. First, the technology can be used to produce medically important substances. The list of these substances is quite large and would include insulin, interferon, and human growth hormone. The technology also has great application in the field of immunology. In order to protect organisms from viral disease, doctors must inject a killed or attenuated virus. Scientists can use the technology to disable a toxin gene, thus producing a viral substance that triggers production of antibodies without the possibility of producing the disease.

A second benefit is in the field of agriculture. This technology can improve the genetic fitness of various plant species. Basic research using this technology could increase the efficiency of photosynthesis, increase plant resistance (to salinity, to drought, to viruses), and reduce a plant's demand for nitrogen fertilizer.

Third, gene splicing can aid industrial and environmental processes. Industries that manufacture drugs, plastics, industrial chemicals, vitamins, and cheese will benefit from this technology. Also scientists have begun to develop organisms that can clean up oil spills or toxic wastes.

This last benefit, however, also raises one of the greatest scientific concerns over the use of biotechnology. The escape (or even intentional release) of a genetically engineered organism might wreak havoc on the environment. Scientists have created microorganisms that dissolve oil spills or reduce frost on plants. Critics of gene splicing fear that radically altered organisms could occupy new ecological niches, destroy existing ecosystems, or drive certain species to extinction.

A significant question is whether life should be patented at

all. Most religious leaders say no. A 1995 gathering of religious leaders representing virtually every major religious tradition spoke out against the patenting of genetically engineered substances. They argued that life is the creation of God, not humans, and should not be patented as human inventions.{6}

The broader theological question is *whether* genetic engineering should be used and, if permitted, *how* it should be used. The natural reaction for many in society is to reject new forms of technology because they are dangerous. Christians, however, should take into account God's command to humankind in the cultural mandate (Gen. 1:28). Christians should avoid the reflex reaction that scientists should not tinker with life; instead Christians should consider how this technology should be used responsibly.

One key issue is the worldview behind most scientific research. Modern science rests on an evolutionary assumption. Many scientists assume that life on this planet is the result of millions of years of a chance evolutionary process. Therefore they conclude that intelligent scientists can do a better job of directing the evolutionary process than nature can do by chance. Even evolutionary scientists warn of this potential danger. Ethan Singer believes that scientists will "verify a few predictions, and then gradually forget that knowing something isn't the same as knowing everything. . . . At each stage we will get a little cockier, a little surer we know all the possibilities."{7}

In essence biotechnology gives scientists the tools they have always wanted to drive the evolutionary spiral higher and higher. Julian Huxley looked forward to the day in which scientists could fill the "position of business manager for the cosmic process of evolution."{8} Certainly this technology enables scientists to create new forms of life and alter existing forms in ways that have been impossible until now.

How should Christians respond? They should humbly acknowledge that God is the sovereign Creator and that man has finite knowledge. Genetic engineering gives scientists the technological ability to be gods, but they lack the wisdom, knowledge, and moral capacity to act like God.

Even evolutionary scientists who deny the existence of God and believe that all life is the result of an impersonal evolutionary process express concern about the potential dangers of this technology. Erwin Chargaff asked, "Have we the right to counteract, irreversibly, the evolutionary wisdom of millions of years, in order to satisfy the ambition and curiosity of a few scientists?"{9} His answer is no. The Christian's answer should also be the same when we realize that God is the Creator of life. We do not have the right to "rewrite the fifth day of creation."{10}

What is the place for genetic engineering within a biblical framework? The answer to that question can be found by distinguishing between two types of research. The first could be called genetic repair. This research attempts to remove genetic defects and develop techniques that will provide treatments for existing diseases. Applications would include various forms of genetic therapy and genetic surgery as well as modifications of existing microorganisms to produce beneficial results.

The Human Genome Project has been able to pinpoint the location and sequence of the approximately 100,000 human genes.{11} Further advances in biotechnology will allow scientists to repair these defective sequences and eventually remove these genetic diseases from our population.

Genetic disease is not part of God's plan for the world. It is the result of the Fall (Gen. 3). Christians can apply technology to fight these evils without being accused of fighting against God's will.{12} Genetic engineering can and should be used to treat and cure genetic diseases.

A second type of research is the creation of new forms of life. While minor modifications of existing organisms may be permissible, Christians should be concerned about the large-scale production of novel life forms. That potential impact on the environment and on mankind could be considerable. Science is replete with examples of what can happen when an existing organism is introduced into a new environment (e.g., the rabbit into Australia, the rat to Hawaii, or the gypsy moth in the United States). One can only imagine the potential devastation that could occur when a newly created organism is introduced into a new environment.

God created plants and animals as "kinds" (Gen. 1:24). While there is minor variability within these created kinds, there are built-in barriers between these created kinds. Redesigning creatures of any kind cannot be predicted the same way new elements on the periodic chart can be predicted for properties even before they are discovered. Recombinant DNA technology offers great promise in treating genetic disease, but Christians should also be vigilant. While this technology should be used to repair genetic defects, it should not be used to confer the role of creator on scientists.

A related issue in the field of biotechnology is human cloning. It appears that the cloning of a human being will no doubt take place some time in the future since many other mammals have been cloned. Proponents of human cloning argue that it would be a worthwhile scientific endeavor for at least three reasons. First, cloning could be used to produce spare parts. The clone would be genetically identical to the original person, so that a donated organ would not be rejected by the immune system. Second, they argue that cloning might be a way to replace a lost child. A dying infant or child could be cloned so that a couple would replace the child with a genetically identical child. Third, cloning could produce biological immortality. One woman approached scientists in order to clone her deceased father and offered to carry the

cloned baby to term herself.{13}

While cloning of various organisms may be permissible, cloning a human being raises significant questions beginning with the issue of the sanctity of life. Human beings are created in the image of God (Gen. 1:2728) and therefore differ from animals. Human cloning would certainly threaten the sanctity of human life at a number of levels. First, cloning is an inefficient process of procreation as shown in cloning of a sheep. Second, cloning would no doubt produce genetic accidents. Previous experiments with frogs produced numerous embryos that did not survive, and many of those that did survive developed into grotesque monsters. Third, researchers often clone human embryos for various experiments. Although the National Bioethics Advisory Commission did ban cloning of human beings, it permitted the cloning of human embryos for research. Since these embryos are ultimately destroyed, this research raises the same pro-life concerns discussed in the chapter on abortion.

Cloning represents a tampering with the reproductive process at the most basic level. Cloning a human being certainly strays substantially from God's intended procedure of a man and woman producing children within the bounds of matrimony (Gen. 2:24). All sorts of bizarre scenarios can be envisioned. Some homosexual advocates argue that cloning would be an ideal way for homosexual men to reproduce themselves.

Although this would be an alternative form of reproduction, it is reasonable to believe that human clones would still be fully human. For example, some people wonder if a clone would have a soul since this would be such a diversion from God's intended process of procreation. A traducian view of the origin of the soul, where a person receives both body and soul from his parents rather than an act of special creation by God, would imply that a cloned human being would have a soul. In a sense a clone would be no different from an identical twin.

Human cloning, like other forms of genetic engineering, could be used to usher in a "brave new world." James Bonner says "there is nothing to prevent us from taking a thousand [cells]. We could grow any desired number of genetically identical people from individuals who have desirable characteristics."{14} Such a vision conjures up images of Alphas, Betas, Gammas, and Deltas from Aldous Huxley's book *Brave New World* and provides a dismal contrast to God's creation of each individual as unique.

Each person contributes to both the unity and diversity of humanity. This is perhaps best expressed by the Jewish Midrash: "For a man stamps many coins in one mold and they are all alike; but the King who is king over all kings, the Holy One blessed be he, stamped every man in the mold of the first man, yet not one of them resembles his fellow."{15} Christians should reject future research plans to clone a human being and should reject using cloning as an alternative means of reproduction.

The Challenge of Information Technology

The information revolution is the latest technological advance Christians must consider. The shift to computers and an information-based society has been swift as well as spectacular. The first electronic digital computer, ENIAC, weighed thirty tons, had 18,000 vacuum tubes, and occupied a space as large as a boxcar.{16} Less than forty years later, many hand-held calculators had comparable computing power for a few dollars. Today most people have a computer on their desk with more computing power than engineers could imagine just a few years ago.

The impact of computers on our society was probably best seen when in 1982 *Time* magazine picked the computer as its "Man of the Year"—actually listing it as "Machine of the Year."{17} It is hard to imagine a picture of the Spirit of St. Louis or an Apollo lander on the magazine cover under a banner "Machine of

the Year." This perhaps shows how influential the computer has become in our society.

The computer has become helpful in managing knowledge at a time when the amount of information is expanding exponentially. The information stored in the world's libraries and computers doubles every eight years.{18} In a sense the computer age and the information age seem to go hand in hand.

The rapid development and deployment of computing power however has also raised some significant social and moral questions. People in this society need to think clearly about these issues, but often ignore them or become confused.

One key issue is computer crime. In a sense computer fraud is merely a new field with old problems. Computer crimes are often nothing more than fraud, larceny, and embezzlement carried out by more sophisticated means. The crimes usually involve changing address, records, or files. In short, they are old-fashioned crimes using high technology.

Another concern arises from the centralization of information. Governmental agencies, banks, and businesses use computers to collect information on its citizens and customers. For example, it is estimated that the federal government has on average about fifteen files on each American.{19} Nothing is inherently wrong with collecting information if the information can be kept confidential and is not used for immoral actions. Unfortunately this is often difficult to guarantee.

In an information-based society, the centralization of information can be as dangerous as the centralization of power. Given sinful man in a fallen world, we should be concerned about the collection and manipulation of vast amounts of personal information.

In the past, centralized information processing was used for persecution. When Adolf Hitler's Gestapo began rounding up

millions of Jews, information about their religious affiliation was stored in shoe boxes. U.S. Census Bureau punch cards were used to round up Japanese Americans living on the West Coast at the beginning of World War II.{20} Modern technology makes this task much easier. Governmental agencies routinely collect information about citizens' ethnic origin, race, religion, gross income, and even political preference.

Moreover, the problem it not limited to governmental agencies. Many banking systems, for example, utilize electronic funds-transfer systems. Plans to link these systems together into a national system could also provide a means of tracking the actions of citizens. A centralized banking network could fulfill nearly every information need a malevolent dictator might have. This is not to say that such a thing will happen. It does mean, however, that societies that want to monitor their citizens will be able to do so more efficiently with computer technology.

A related problem arises from the confidentiality of computer records. Computer records can be abused like any other system. Reputations built up over a lifetime can be ruined by computer errors and often there is little recourse for the victim. Congress passed the 1974 Privacy Act which allows citizens to find out what records federal bureaucracies have on them and to correct any errors.{21} But more legislation is needed than this particular act.

The proliferation of computers has presented another set of social and moral concerns. In the recent past most of that information was centralized and required the expertise of the "high priests of FORTRAN" to utilize it. Now most people have access to information because of increasing numbers of personal computers and increased access to information through the Internet. This access to information will have many interesting sociological ramifications, and it is also creating a set of troubling ethical questions. The proliferation of computers that can tie into other computers

provides more opportunities for computerized crime.

The news media frequently carry reports about computer "hackers" who have been able to gain access to confidential computer systems and obtain or interfere with the data banks. Although these were supposed to be secure systems, enterprising computer hackers broke in anyway. In many cases this merely involved curious teenagers. Nevertheless computer hacking has become a developing area of crime. Criminals might use computer access to forge documents, change records, and draft checks. They can even use computers for blackmail by holding files for ransom and threatening to destroy them if their demands are not met. Unless better methods of security are found, professional criminals will begin to crack computer security codes and gain quick access into sensitive files.

As with most technological breakthroughs, engineers have outrun lawmakers. Computer deployment has created a number of legal questions. First, there is the problem of establishing penalties of computer crime. Typically, intellectual property has a different status in our criminal justice system. Legal scholars should evaluate the notion that ideas and information need not be protected in the same way as property. Legislators need to enact computer information protection laws that will deter criminals, or even curious computer hackers, from breaking into confidential records.

A second legal problem arises from the question of jurisdiction. Telecommunications allows information to be shared across state and even national borders. Few federal statutes govern this area and less than half the states have laws dealing with information abuse.

Enforcement will also be a problem for several reasons. One reason is the previously stated problem of jurisdiction. Another is that police departments rarely train their personnel in computer abuse and fraud. A third reason is lack of personnel. Computers are nearly as ubiquitous as telephones

or photocopiers.

Computer fraud also raises questions about the role of insurance companies. How do companies insure an electronic asset? What value does computer information have? These questions also need to be addressed in the future.

Technology and Human Nature

These new technologies will also challenge our views of human nature. Already medical technology is challenging our views of what it means to be human. A key question in the abortion debate is, When does human life begin? Is an embryo human? What about a developing fetus? Although the Bible provides answers to these questions, society often takes its cue from pronouncements that do not square with biblical truth.

Biotechnology raises yet another set of questions. Is a frozen embryo human and deserving of a right to life? Is a clone human? Would a clone have a soul? These and many more questions will have to be answered. Although the Bible doesn't directly address such issues as genetically engineered humans or clones, key biblical passages (Ps. 139, Ps. 51:5) certainly seem to teach that an embryo is a human created in the image of God.

Information technology also raises questions about human nature in an unexpected way. Researchers believe that as computer technology advances, we will begin to analyze the human mind in physical terms. In *The Society of Mind,* Marvin Minsky, professor at the Massachusetts Institute of Technology, says that "the mind, the soul, the self, are not a singly ghostly entity but a society of agents, deeply integrated, yet each one rather mindless on its own."{22} He dreams of being able ultimately to reduce mind (and therefore human nature) to natural mechanism. Obviously this is not an empirical statement, but a metaphysical one that attempts to reduce everything (including mind) to matter.

Will we some day elevate computers to the level of humanity? One article asked the question, Would an Intelligent Computer Have a "Right to Life?"{23} Granting computer rights might be something society might consider since many are already willing to grant certain rights to animals.

In a sense the question is whether an intelligent computer would have a soul and therefore access to fundamental human rights. As bizarre as the question may sound, it was no doubt inevitable. When 17th century philosopher Gottfried Wilhelm von Leibniz first described a thinking machine, he was careful to point out that this machine would not have a soul—fearful perhaps of reaction from the church. Already scientists predict that computer intelligence will create "an intelligence beyond man's" and provide wonderful new capabilities.{25} One of the great challenges in the future will be how to manage new computing power that will outstrip human intelligence.

Once again this is a challenge for Christians in the 21 st century. Human beings are more than just proteins and nucleic acids. Human being are more than bits and bytes. We are created in the image of God and therefore have a spiritual dimension. Perhaps this must be our central message to a world enamored with technology: human beings are created in the image of God and must be treated with dignity and respect.

Notes

1. Memo from Charles H. Duell, Director of the U.S. Patent Office, 1899.

2. Jacques Ellul, *The Technological Society* (New York: Vintage, 1964).

3. C. S. Lewis, *The Abolition of Man* (New York: Macmillan, 1947), 6869, 71 (italics his).

4. Ethan Singer, cited in Nicholas Wade, “Gene Splicing: Congress Starts Framing Law for Research,” *Science*, 1 April 1977, 39.

5. Michael Crichton, *The Andromeda Strain* (New York: Dell, 1969).

6. Kenneth Woodward, “Thou Shalt Not Patent!” *Newsweek*, 29 May 1995, 68.

7. Testimony by Ethan Singer before the Subcommittee on Health and the Environment, House Committee on Interstate and Foreign Commerce, *Hearings*, 15 March 1977, 79.

8. Julian Huxley, cited in Joseph Fletcher, *The Ethics of Genetic Control* (Garden City, NY: Anchor, 1974), 8.

9. Erwin Chargaff, cited in George Wald, “The Case against Genetic Engineering,” *The Sciences*, May 1976, 10.

10. Nancy McCann, “The DNA Maelstrom: Science and Industry Rewrite the Fifth Day of Creation,” *Sojourners*, May 1977, 2326.

11. Philip Elmer-Dewitt, “The Genetic Revolution,” *Time*, 17 January 1994, 49.

12. Skeptics sometimes argue that fighting disease is the same as fighting against God’s will. Albert Camus poses this dilemma for Dr. Reux in *The Plague*. Christians should follow the cultural mandate (Gen. 1:28) and use genetic technology to treat and cure genetic disease.

13. Sharon Begley, “Little Lamb, Who Made Thee?” *Newsweek*, 10 March 1997, 55.

14. James Bonner, quoted in *Los Angeles Times*, 17 May 1971, 1.

15. N. N. Glazer, *Hammer on the Rock: A Short Midrash Reader* (New York: Schocken, 1962), 15.

16. Philip Elmer-De-Witt, “A Birthday Party for ENIAC,” *Time*, 24 February 1986, 63.

17. “Machine of the Year,” *Time*, 3 January 1983, 1324.

18. “Harper’s Index,” *Harper’s*, October 1984, 9.

19. Ted Gest, “Who Is Watching You?” *U.S. News and World Report*, 12 July 1982, 35.

20. David Burnham, *The Rise of the Computer State* (New York: Random House, 1983).

21. Martha Farnsworth Riche, “The Rising Tide of Privacy Laws,” *American Demographics*, March 1990, 24.

22. Richard Lipkin, “Making Machines in Mind’s Image,” *Insight*, 15 February 1988, 812.

23. Robert Mueller and Erik Mueller, “Would an Intelligent Computer Have a ‘Right to Life?'” *Creative Computing*, August 1983, 14961.

24. Danny Hillis, “Can They Feel Your Pain?” *Newsweek*, 5 May 1997, 57.

25. Robert Jastrow, “Toward an Intelligence beyond Man’s,” *Time*, 20 February 1978, 59.

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Computers and the Information

Revolution

The Impact of the Information Revolution

What has been the impact of the information revolution, and how should Christians respond? Those are the questions we will consider in this essay. Let’s begin by considering how fast our world shifted to a computer-based society. At the end of World War 2, the first electronic digital computer ENIAC weighed thirty tons, had 18,000 vacuum tubes, and occupied a space as large as a boxcar. Less than forty years later, many hand-held calculators had comparable computing power for a few dollars. Today most people have a computer on their desk with more computing power than engineers could imagine just a few years ago.

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The rapid development and deployment of computing power however has also raised some significant social and moral questions. People in this society need to think clearly about these issues, but often ignore them or become confused.

One key issue is computer crime. In a sense, computer fraud is merely a new field with old problems. Computer crimes are

often nothing more than fraud, larceny, and embezzlement carried out by more sophisticated means. The crimes usually involve changing address, records, or files. In short, they are old-fashioned crimes using high technology.

Another concern arises from the centralization of information. Governmental agencies, banks, and businesses use computers to collect information on its citizens and customers. For example, it is estimated that the federal government has on average about fifteen files on each American. Nothing is inherently wrong with collecting information if the information can be kept confidential and is not used for immoral actions. Unfortunately this is often difficult to guarantee.

In an information-based society, the centralization of information can be as dangerous as the centralization of power. Given sinful man in a fallen world, we should be concerned about the collection and manipulation of vast amounts of personal information.

In the past, centralized information processing was used for persecution. When Adolf Hitler’s Gestapo began rounding up millions of Jews, information about their religious affiliation was stored in shoe boxes. U.S. Census Bureau punch cards were used to round up Japanese Americans living on the West Coast at the beginning of World War II. Modern technology makes this task much easier.

Moreover, the problem it not limited to governmental agencies. Many banking systems, for example, utilize electronic funds-transfer systems. Plans to link these systems together into a national system could also provide a means of tracking the actions of citizens. A centralized banking network could fulfill nearly every information need a malevolent dictator might have. This is not to say that such a thing will happen, but it shows the challenges facing each of us due to the information revolution.

The Social Challenges of Computers

One of the biggest challenges raised by the widespread use of computers is privacy and the confidentiality of computer records. Computer records can be abused like any other system. Reputations built up over a lifetime can be ruined by computer errors and often there is little recourse for the victim. Congress passed the 1974 Privacy Act which allows citizens to find out what records federal bureaucracies have on them and to correct any errors. But more legislation is needed than this particular act and Congress needs to consider legislation that applies to the information revolution.

The proliferation of computers has presented another set of social and moral concerns. In the recent past most of that information was centralized and required the expertise of the "high priests of FORTRAN" to utilize it. Now most people have access to information because of increasing numbers of personal computers and increased access to information through the Internet. This access to information will have many interesting sociological ramifications, and it is also creating a set of troubling ethical questions. The proliferation of computers that can tie into other computers provides more opportunities for computerized crime.

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As with most technological breakthroughs, engineers have outrun lawmakers. Computer deployment has created a number of legal questions. First, there is the problem of establishing penalties of computer crime. Typically, intellectual property has a different status in our criminal justice system. Legal scholars should evaluate the notion that ideas and information need not be protected in the same way as property. Legislators need to enact computer information protection laws that will deter criminals, or even curious computer hackers, from breaking into confidential records.

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Enforcement will also be a problem for several reasons. One reason is the previously stated problem of jurisdiction. Another is that police departments rarely train their personnel in computer abuse and fraud. A third reason is lack of personnel. Computers are nearly as ubiquitous as telephones or photocopiers.

Computer fraud also raises questions about the role of insurance companies. How do companies insure an electronic asset? What value does computer information have? These questions also need to be addressed in the future.

Computers are a wonderful tool, but like any technology poses new challenges in the social and political arenas. I believe that Christians should be the forefront of these new technologies providing wise direction and moral guidelines. We need Christians in the fields of computer technology and electrical engineering who can wisely guide us into the 21st century.

Principles for Computer Ethics

I would like to propose some principles for computer ethics. The first principle is that **one should never do with computers what he or she would consider immoral without them.** An act does not gain morality because a computer has made it easier to achieve. If it is unethical for someone to rummage through your desk, then it is equally unethical for that person to search your computer files. If it is illegal to violate copyright law and photocopy a book, then it is equally wrong to copy a disk of computer software.

A second principle is to **treat information as something that has value.** People who use computers to obtain unauthorized information often do not realize they are doing something wrong. Since information is not a tangible object and can be shared, it does not seem to them like stealing since it does not deprive someone of something. Yet in an information-based society, information is a valuable asset. Stealing information should carry similar legal penalties as stealing tangible objects.

A third principle is to remember that **computers are merely tools to be used, not technology to be worshiped**. God's mandate is to use technology wisely within His creation. Many commentators express concern that within an information society, people may be tempted to replace ethics with statistics.

Massive banks of computer data already exert a powerful influence on public policy. Christians must resist society's tendency to undermine the moral basis of right and wrong with facts and figures. Unfortunately, growing evidence indicates that the computer revolution has been a contributing factor in the change from a moral foundation to a statistical one. The adoption of consensus ethics ("51 percent make it right") and the overuse of cost-benefit analysis (a modernized form of utilitarianism) give evidence of this shift.

Fourth, **computers should not replace human intelligence.** In *The Society of Mind* Marvin Minsky, professor at the Massachusetts Institute of Technology, says that "the mind, the soul, the self, are not a singly ghostly entity but a society of agents, deeply integrated, yet each one rather mindless on its own." He dreams of being able ultimately to reduce mind (and therefore human nature) to natural mechanism. Obviously this is not an empirical statement, but a metaphysical one that attempts to reduce everything (including mind) to matter.

The implications, however, are profound. Besides lowering humans to the material process, it begins to elevate machines to the human level. One article asked the question, Would an Intelligent Computer Have a "Right to Life?" Granting computer rights might be something society might consider since many are already willing to grant certain rights to animals.

In a sense the question is whether an intelligent computer would have a soul and therefore access to fundamental human rights. As bizarre as the question may sound, it was no doubt inevitable. When seventeenth-century philosopher Gottfried Wilhelm von Leibniz first described a thinking machine, he was careful to point out that this machine would not have a soul, fearful perhaps of reaction from the church. But this will be our challenge in the future: how to manage new computing power that will most likely outstrip human intelligence.

The Bible teaches that humans are more than bits and bytes, more than blood and bones. Created in the image of God, human beings have spiritual dimensions. They are more than complex computers. Computers should be used for what they do best: analyze discrete data with objective criteria. Computers are a wonderful tool, but they should not replace human intelligence and intuition.

Biblical Principles Concerning Technology

I would like to present a set of biblical principles concerning technology in general and computer technology in particular.

In essence, technology is the systematic modification of the environment for human ends. Often it is a process or activity that extends or enhances a human function. A microscope, for example, extends man's visual perception. A tractor extends one's physical ability. A computer extends a person's ability to calculate. Technology also includes devices that make physical processes more efficient. The many chemical processes we use to make products fit this description of technology.

The biblical mandate for developing and using technology is stated in Genesis 1:28. God gave mankind dominion over the land, and we are obliged to use and manage these resources wisely in serving the Lord. God's ideal was not to have a world composed exclusively of primitive areas. Before the Fall (Gen. 2:15) Adam was to cultivate and keep the Garden of Eden. After the Fall the same command pertains to the application of technology to this fallen world, a world that "groans" in travail (Rom. 8:22). Technology can benefit mankind in exercising proper dominion, and thus remove some of the effects of the Fall (such as curing disease, breeding livestock, or growing better crops).

Technology is neither good or evil. The worldview behind the particular technology determines its value. In the Old Testament, technology was used both for good (e.g., the building of the ark, Gen. 6) and for evil (e.g., the building of the Tower of Babel, Gen. 11). Therefore the focus should not be so much on the technology itself as on the philosophical motivation behind its use. There are a number of important principles that should be considered.

First, **technology should be seen as a tool, not as an end in**

itself. There is nothing sacred about technology. Unfortunately Western culture tends to rely on it more than is appropriate. If a computer, for example, proves a particular point, people have a greater tendency to believe it than if the answer was a well-reasoned conclusion given by a person. If a machine can do the job, employers are prone to mechanize, even if human labor does a better or more creative job. Often our society unconsciously places machines over man. Humans become servants to machines rather than the other way around.

There is a tendency to look to science and engineering to solve problems that really may be due to human sinfulness (wars, prejudice, greed), the fallenness of the world (death, disease), or God's curse on Adam (finite resources). In Western culture especially, we tend to believe that technology will save us from our problems and thus we use technology as a substitute for God. Christians must not fall into this trap, but instead must exhibit their ultimate dependence on God. Christians must also differentiate between problems that demand a technological solution and ones that can be remedied by a social or spiritual one.

As Christians we should see the value of technology but not be seduced into believing that more and better technology will solve social and moral problems. Computers and the Internet will tell us more about *how* people live, but they won't tell us how *to* live. Televisions, VCRs, and computers may enrich our lives, but they won't provide the direction we need in our lives. The answer is not more computers and more technology. The ultimate answer to our problems is a personal relationship with Jesus Christ.

A second principle is that **technology should be applied in different ways, according to specific instructions.** For example, there are distinctions between man and animal that, because we are created in God's image (Gen. 1:26-27), call for different applications of medical science. Using artificial insemination to improve the genetic fitness of livestock does

not justify using it on human beings. Christians should resist the idea that just because we can do something we should do it. Technological ability does not grant moral permission.

Many commentators, most notably E. F. Schulmacher, have focused on the notion of appropriate technology. In Third World countries, for example, sophisticated energy-intensive and capital-intensive forms of agriculture may be inappropriate for the culture as it presently exists. Industrial advance often brings social disruption and increasing havoc to a society. Developing countries must use caution in choosing the appropriate steps to industrialize, lest they be greatly harmed in the process.

I believe we should resist the temptation to solve every problem with computers. Our society today seems bent to putting computers in every classroom and in every place of work. As helpful as computers may be, I believe we need to question this seemingly mindless attempt to fill our world with computers. They are a wonderful tool, but that is all they are. We must be careful not to substitute computers for basics like phonics, mathematics, logic, and wise business practices.

Third, **ethics rather than technology must determine the direction of our society.** Jacques Ellul has expressed the concern that technology moves society instead of vice versa. Our society today seems all too motivated by a technological imperative in our culture. The technological ability to do something is not the same as a moral imperative to do it. Technology should not determine ethics.

Though scientists may possess the technological ability to be gods, they nevertheless lack the capacity to act like gods. Too often, man has tried to use technology to become God. He uses it to work out his own physical salvation, to enhance his own evolution, or even to attempt to create life. Christians who take seriously human fallenness will humbly admit that we

often do not know enough about God's creation to use technology wisely. The reality of human sinfulness means that society should be careful to prevent the use of technology for greed and exploitation.

Technology's fruits can be both sweet and bitter. C.S. Lewis writes in *The Abolition of Man*, "From this point of view, what we call Man's power over Nature turns out to be power exercised by some men over men with Nature as its instrument. . . . There neither is nor can be any simple increase of power on Man's side. Each new power won by man is a power over man as well. Each advance leaves him weaker as well as stronger. In every victory, besides being the general who triumphs, he is also the prisoner who follows the triumphal car."

Christians must bring strong biblical critique to each technological advance and analyze its impact. Computers are a wonderful tool, but Christians should constantly evaluate their impact as we live through the information revolution.

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