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Asking Questions about Technology, with Specific Reference to Computers

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Where is the Life we have lost in living?
Where is the wisdom we have lost in knowledge?
Where is the knowledge we have lost in information?
T. S. Eliot, *Choruses from 'The Rock'*

Introduction[1]

Historically, appraisals of twenty-first century technology and tools such as computers differ. Some see technology as entirely good, the beneficent basis of higher living standards and the benign source of solutions to problems. Others eschew technology. Warning that the tools of change threaten, *inter alia*, human freedom, and lead to cultural genocide and the mechanization of human life, they point to increased alienation and the undermining of earth-keeping values. Others assert technology is morally neutral. Its impacts vary according to context and use.[2]

My angle of vision falls in the third grouping. Technology needs to be approached with caution and

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1 I am grateful to Carrie Beverly, Martha Brahm, David Ciscel, Rich Cook, Nancy Dekar, Ross Lawford, Randy Leslie and Randall Mullins for comments on a draft of this article. The errors are mine, all mine!

2 Ian Barbour, *Ethics in an Age of Technology. The Gifford Lectures 1989-1991* (San Francisco: Harper, 1993), v. 2, ch. 1. Barbour examines science, technology and religion. He won the 1999 Templeton Prize.

applied with wisdom. Like all forms of technology and like any tool, computers have the potential to be used in constructive or destructive ways. If we are to benefit from the former and not succumb to the latter, we need to be conscious of the potential dangers inherent in accepting technology unquestionably.

In terms of various theories of justice, I am concerned with an ethics of consequences and responsibility.[3] The ultimate question of responsibility has to do with life itself. In this article, I write of justice as a matter of creating a society that meets basic human needs and looks beyond to ensure that all people live well.

A central tenet of the thought of French theologian Jacques Ellul is that one cannot take the good parts but leave the bad. The two faces are inextricably linked. Like Ellul, I am shaped by a Reformed Tradition that accents the right use of God's gifts. We are to use the good things of life in so far as they help us to promote the common good and do not become ends. It is idolatry to value earthly things disproportionately.[4]

I am also shaped by the social ferment of the period when I came to adulthood. From 1961-65 I attended the University of California at Berkeley. The campus simmered with the fervour of the Civil Rights, the Feminist, the anti-Vietnam War and the Free Speech movements. On December 3, 1964 as I prepared to enter Sproul Hall, the main administrative building on campus, Mario Savio concluded a speech with these words:

> There is a time when the operation of the machine becomes so odious, makes you so sick at heart, that you can't take part; you can't even passively take part, and you've got to put your bodies upon the gears and upon the wheels, upon the levers, upon all the apparatus, and you've got to make it stop. And you've got to indicate to the people who run it, to the people who own it, that unless you're free, the machine will be prevented from working at all![5]

These days, such warnings about the extent to which machines and bureaucracies were invading our lives seem especially prescient. While the euphoria of the 1960s has faded, positive values of the movements of the period, for example community and justice, continue to lead me and others to wrestle with basic questions about technology. I work against war, injustice and ecological degradation. Technologies contribute to each and vice versa. In terms of technology, Nazi Germany was a highly advanced country. Technology helped perpetuate genocide. Today, many toxic chemicals pose a threat to human life and to the

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3 Paul R. Dekar, 'Towards a Theology of Responsibility', *Theodolite* 7 (1987):11-19. The thought of H. Richard Niebuhr, Reinhold Niebuhr and John Rawls shaped my perspective.

4 Calvin, Institutes 3.10.1-6. Jacques Ellul, *The Technological Society* (New York: Vintage, 1964); idem, *The Presence of the Kingdom* (New York: Seabird, 1967); idem, *The Ethics of Freedom* (Grand Rapids: Eerdmans, 1976). For a discussion of Enlightenment thought as exacerbating the problem of humans over-valorizing human reason, see R. G. Collingwood, *The Idea of History* (Oxford: Clarendon, 1946).

5 <http://fsm-a.org>. To recall the period, I read material in my personal files. Highlighted articles in the May 1965 issue of *Fellowship* (six deal with moral and technological implications of peace on earth) and the April-May 1970 issue of *Motive* on the environmental crisis suggest their influence on me at the time.

ability of the earth to clean up after us. At the same time, the struggles to prevent genocide and to clean up the environment have birthed new technologies and modified others in the service of the common good.[6]

New technologies and tools quicken change. For example, in ancient Egypt the invention of papyrus stimulated a shift from a primarily oral-aural society to one based on writing. In China, the invention of gunpowder in the ninth century contributed to the unification of the country.[7] In Europe, the invention of the printing press in the fifteenth century fuelled an increase in literacy.

At least in highly industrialized countries, computers are central to a revolution that influences almost all aspects of our lives. In the United States, word processors, E-mail and Automated Teller Machines invade our living. We are sometimes scarcely aware of how our lives, to say nothing of the world at large change as a result. Computers that understand speech, read script and perform tasks previously carried out by humans foreshadow an age in which many industries are automated, including banking, insurance and tourism. The three main institutions driving economic globalization (the World Trade Organization, the International Monetary Fund and the World Bank) extend corporate power structures of the highly industrialized countries to the far reaches of the world, often to the detriment of local communities and relatively self-sufficient national economies.[8]

The startling rapidity and pervasiveness of cultural transformation that computers foster is remarkable. Modern technology, including the world of computers, is not simply an extension of humans making things through the power of improved science but a new way of knowing and making. While it is too early to know what impact the computer will have on human thought, we seem to be dealing with a co-penetration of science and technology that defines life in North America, and perhaps world-wide in unique ways.[9]

Technology critic Neil Postman warns that computers threaten to impose on us the ways they are used. 'The fundamental metaphorical message of the computer … is that we are machines—thinking machines, to be sure, but machines nonetheless…. It subordinates the claims of our nature, our biology, our

6 Stephen G. Greene, 'Technology Helps Small Environmental Group Get Big Results', *Chronicle of Philanthropy*, January 11, 2001 http://philanthropy.com.

7 'War, Technology of', *New Encyclopedia Britannica*, 29:541-2. The Arab Muslim world and European countries benefited even more from this advance of technology. Whether this was good is another question.

8 Herman E. Daly and John B. Cobb, Jr., *For the Common Good. Redirecting the Economy toward Community, the Environment, and a Sustainable Future* (Boston: Beacon, 1994); Jeremy Rifkin, T*he End of Work. The Decline of the Global Labor Force and the Dawn of the Post-Market Era* (New York: Putnam's, 1996); Michael Zweig, ed., *Religion and Economic Justice* (Philadelphia: Temple, 1991).

9 Michael Heim, *Electric Language: A Philosophical Study of Word Processing*, Foreword by David Gelernter (2d. ed., New Haven: Yale University Press, 1999).

emotions, our spirituality.'[10]

Is he serious? Yes, as evidenced by recent discussion in which serious thinkers suggest that cyberspace knows no boundaries. For some, cyberspace is an out-of-control place in which any attempt to impose real world laws would be akin to an attempt to impose new laws on a conquered or colonized people. This perspective suggests that computers have potential constructive or destructive use when placed in the hands of sinful humans.[11]

Computers give rise to a new entity, the virtual reality. Overwhelmed by images on television, computer screens and videos, people withdraw to a private world and refuse to accept responsibility, to acknowledge that doing things face to face and doing things in cyberspace are not the same. Can we educate people to tell when people are real? Laurie Anderson writes, 'When I'm working with computerized voices, I have the illusion that I'm in touch with another intelligence. On bad days — when everything crashes — I start yelling at my computer.' Patricia Volk states, 'Technology Makes Me Mad: First there was breast-feeding. Then there was formula. Now there's patent No. 5,571,084, a micro-processor-controlled breast-pump vested with a programming chip that vacuums out milk for your baby without human contact. Why? So you can answer more E-mail?'[12]

We are discussing something more troubling than doublespeak or Murphy's Law (anything that can go wrong will). New computers are powerful. In addition to good uses of this technology, we are subjected to new abuses such as hacking and the disabling of entire communications networks by the transmission of 'viruses'. The same technology that enlarges access to data can be used to spawn complex surveillance and information systems such as nanotechnology. We must address ethical concerns raised by twenty-first century computers.

Futurist Alvin Toffler describes an experiment he conducted with high school students. He gave them index cards and said, 'Write down seven things that will happen in the future.' They said things like there will be war, or we will all drown in ecological sludge. He noticed that very few used the word 'I' but that changed when he gave them another set of index cards and asked them to write down seven things that would happen to them. The responses were much more personal: I will marry; I will graduate; I will die; and so on. Toffler concluded that there was a large gulf between the world that they were seeing out there and their own. '[T]he image of reality that

10 Neil Postman, *Technopoly. The Surrender of Culture to Technology* (New York: Knopf, 1993), p. 111. George Parkin Grant, *Technology and Justice* (Notre Dame: University of Notre Dame Press, 1986) expands on this point.

11 Bill Joy, 'Why the Future Doesn't Need Us', *Wired Archive* 8.04-April 2000 <http://www.wired.com>. As an example of anti-technology rage, Joy cites Theodore Kaczynski and his dystopian vision. See also Chris Wood, 'Dealing with Tech Rage,' Macleans, March 19, 2001, <http://www.macleans.ca>.

12 *New York Times Magazine*, September 28, 1997, pp. 68, 116.

they're getting from the media is one of high-speed rapid change, and the image that they're getting in the classroom is one of no change at all.'[13]

Another scholar tried the experiment at a private school in 1996. The conclusion drawn from 127 responses was the same. The school then spent in excess of $300,000 to install and update technology in the classroom. No follow-up study has been requested. The effort to bring technology into the school was not designed to raise student knowledge or skills. The school long enjoyed the reputation that all graduating seniors had full scholarships to major universities. Technology was the answer to falling enrolment, not student achievement or improvement. This does not make the administrators guilty of unethical or immoral acts. The survey results revealed some very important determinants of how we avoid responsibility and how we continue to teach this avoidance to the next generation, even to students who learn technology from an early age.[14]

I replicated Toffler's simple survey at Memphis Theological Seminary and discovered a similar disjunction between the world in which we live our private lives and the world at large. This has led me to explore implications of introducing computers into Memphis Theological Seminary and the wider community it serves.

What is Technology?

Technology is 'the application of organized knowledge to practical tasks by ordered systems of people and machines'.[15] The word in English has origins in two Greek words, *techne* (which means an art or craft) and *logia* (which means the systematic treatment of). Hence, classically technology may be understood as the systematic study and application of arts, crafts and the practical or industrial arts.

Technology is an applied science. The distinction between theoretical and applied science is crucial. When Albert Einstein advised President Franklin D. Roosevelt that in the light of modern discoveries of physics, atomic weapons could be built, and that the United States should do it, he was making the case that the pure science of physics should be directed towards political and social ends. President Roosevelt might have decided not to proceed from theory to application. Urgent practical considerations of the day led to the decision to develop and use nuclear weapons.

Is there ever a time when, if we can build it, we should not? I think there is, at least when technology has advanced faster than ethical reflection on that technology. (However important the following case studies are, they require examination that is impossible in this article.) For example, in my view we should have refused nuclear weaponry. In the light of Three Mile Island (1979) and Chernobyl (1986), the jury is still out

13 *Wired magazine* 1.05 November 1993, <http://www.wired.com>.

14 Carrie Beverly, personal correspondence.

15 Barbour, II:3.

in relation to nuclear energy. Arguably we should not move ahead in the area of cloning. A recent headline announces, 'Defiant trio of researchers insist they'll clone children.'[16] In the arena of climate change and global warming, Art Bell and Whitley Strieber argue that self-conceived and designed machines are needed if humanity is to survive the 'coming global superstorm'. If we do, it will be because machine intelligence is superior to human intelligence.[17]

I am suspicious of claims that celebrate technology mindlessly, without a cautionary tale. An old French riddle for children told to a meeting of the Club of Rome, a group of respected bureaucrats, educators, industrialists and scientists, describes the human predicament:

> Suppose you own a pond on which a water lily is growing. The lily plant doubles in size each day. If the lily were allowed to grow unchecked, it would completely cover the pond in 30 days, choking off the other forms of life in the water. For a long time the lily plant seems small, and so you decide not to worry about cutting it back until it covers half the pond. On what day will that be? On the twenty-ninth day, of course. You have one day to save the pond.[18]

Many challenges confront us. In itself, each is serious. Together, these worries combine to make the situation more intense. Like the water lily, together they gather momentum exponentially. Our pond, planet earth, has reached the twenty-ninth day in terms of the carrying capacity of earth, a subject that animates the work of the Club of Rome.

Is it true with computer technology? I will examine this question in two ways. First, I will identify areas that are good in computer technology and those that elicit concern. I will then articulate criteria by which to address the issues raised.

What is Good about Computers?

I am not a neo-Luddite.[19] A modern person, I am grateful for advances in transportation, medicine and other areas. I use computers all the time. To prepare this article, I have downloaded material from the World Wide Web and used search engines to identify books not available in the Memphis Theological Seminary library. Word processing has enabled me to produce this article efficiently.

16 *Memphis Commercial Appeal*, March 10, 2001.

17 Art Bell and Whitley Strieber, *The Coming Global Superstorm* (New York: Pocket, 2000).

18 Donella H. Meadows et al, *The Limits to Growth* (New York: New American, 1974), p. 37. Meadows argues a sustainable society is still attainable. Maturity, compassion and wise policies are required more than economic growth or technological fixes. Donella H. Meadows et al, *Beyond the Limits. Confronting Global Collapse. Envisioning a Sustainable Future* (White River Junction: Chelsea Green, 1992).

19 In early 19th century England, introduction of machinery for textile production led to unemployment and poorer conditions for those still working. Under a real or imaginary leader named King Ludd, organized bands of men known as Luddites smashed the machines and burnt down factories to draw attention to their plight. They carefully avoided attacking people until one employer responded with force. Severe repression followed. At a mass trial in 1813 at York, many Luddites were hung; others were transported to Australia. Supporting their cause, poets Byron (1788-1824) and Shelley (1792-1822) ridiculed the militarist policies of the government. For an introduction, 'Luddites and Friends', *Canadian Broadcasting Corporation Ideas*, 17, 24 February 1997, Transcript 9706.

Two computer breakdowns have not led me to return to my typewriter. To elicit feedback on my ideas, I can forward this article as an attachment to friends by E-mail and receive helpful critique.

As with most other technologies, the potential effects of computers are mixed. Let me cite one area in which computers have proved enormously helpful. A major justice issue concerns the gap between the information-rich and the information-poor. E-mail and the Internet have increased access to information, at least in the United States and elsewhere. Let me illustrate how technology can make information available to increasing numbers of people. In East Africa, civil wars, human rights violations and the HIV-AIDS epidemic have decimated Uganda's population. For three decades Makerere University, Uganda's principal medical faculty, has not had funds to purchase books or journals. Ease of communications through the 'electronic highway' makes crucial medical knowledge widely available and mitigates the need for the university library to upgrade library holdings.[20]

Computers are relevant to health when used in medical research. They can also aid medical understanding on the part of ordinary individuals as well as medical professionals. Recently, technology empowered a friend, who accessed medical information through his personal computer, to take a more active role in his treatment for a medical condition. In Hamilton, Ontario, Barbara Patterson runs an eighteen hundred member discussion group on the Internet about Parkinson's Disease.[21] Readers can multiply such examples of positive uses of computers when combined with the judgment of physicians and plain common sense.

Three Baskets of Concern

The mission statement of Memphis Theological Seminary states that we seek to cultivate a love for scholarship, piety and justice. Let me articulate concerns within each basket.

Scholarship

The first is scholarship. The computer has entered the world of higher education. Is this beneficial? And to whom? Are we rightly using this gift of God? My response to these questions is mixed. I use computers and other tools of the technological revolution. In my twenty-seven years of teaching, I have always used slides, overheads and a wide variety of teaching techniques. Now, on occasion I do so with the aid of powerful tools such as PowerPoint. I welcome experimentation in distance learning.[22]

20 Graeme MacQueen, Rick McCutcheon and Joanna Santa-Barbara, 'The Use of Health Initiatives as Peace Initiatives', *Peace and Change* 22 (April 1997):175-97. Conversation with Dr. Charlie Clements.

21 *Hamilton Spectator*, May 12, 2000.

22 I have encouraged projects that seek to bridge the information divide such as Jericho Road and Cooperative Computer Ministries. I have encouraged use of computers in the church. I have seen value in offering a limited number of courses such as that taught by former dean Donald K. McKim, '"Cyber" Barth', *Teaching Theology and Religion* 1, 3 (1998):183-6. I am designing a course to be offered as an experiment in distance learning settings two continents apart. I am aware of logistical issues and possible losses as well as potential gains.

In his work with the Fetzer Institute, a nonprofit foundation that supports research, education and service programmes exploring the integral relationships between body, mind and spirit, teacher Parker Palmer names a malaise that permeates education as the pain of disconnection. Faculty members are disconnected from colleagues, students from their own hearts. To address this pain and infuse learners with confidence that our search for ways to love and serve God is purposeful, Palmer calls for a spirituality of learning that establishes an intimate link between loving, community and knowing. So to teach is to create space in which obedience to truth is practised.[23]

I have long yearned to be part of truth seeking, truth telling servant leadership communities that Palmer describes. Inescapably, we humans need to have a sense of life's final meaning and to come into relationship with that meaning. Our life as God's beloved children is centred around not a body of doctrine but a Person who calls us to himself, in whom we find meaning and whose hands and feet unite with ours. Education is one context in which we grow in our knowledge and love of Jesus.

As I reflect upon my own experience I am awed by the richness of theological education as a resource, indeed an ideal locale in which to realize Palmer's agenda. For example, at Memphis Theological Seminary, one can seek and be found by God. Truth and Light can seize one. One can practise obedience to the truth. As a teacher in this setting, I feel freedom to pursue God. I have developed courses intended to facilitate self-directed, problem-solving, action-oriented learning. I have encouraged students to identify their own goals and objectives for each class. I have sought to encourage creativity and the use of arts. I have moved from content-based to process-based learning.

As an illustration, I once offered a course on the history of spirituality. As I developed lectures on movements and theologians, I discovered that what students and I myself wanted was neither history, nor doctrine. We wanted to grow in Christ. I transformed the course into one highlighting spiritual formation. Every other year I offer Memphis Theological Seminary students 'Merton, Monasticism and Religious Pluralism'. It includes a week's retreat at the Trappist Abbey of Gethsemani in Kentucky. Students often comment that it is the course of mine from which they benefit most.

Reflecting on my practice of teaching, I am convinced that good pedagogy cannot be reduced to technological innovation. In every class I offer, my ability to connect with students depends less on the methods that I use, and more on my vulnerability, my willingness to be a guide, my commitment to free students to make connections between my story, course themes and their journeys.

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23 *To Know as we are Known, Education as a Spiritual Journey* (San Francisco: Harper, 1983); *The Courage to Teach. Exploring the Inner Landscape of a Teacher's Life* (San Francisco: Jossey-Bass, 1998).

The entry of computers at every level of education will intensify two adverse trends that already exist in higher education.

One is turning education into an agency of corporate society. A student jumps through hoops as a means of getting a job or letters behind her or his name on a calling card. She or he comes to value education as a ticket to some earthly paradise. According to Palmer, this leads to a 'divided life'.

A number of critics have called attention to the other trend, named variously as the alienating, deskilling or dumbing down of students.[24] Like television, the computer becomes entertainment. It stupefies people. At least, it does not hinder stultifying of people. The presence of personal computers in the lives of students at an earlier and earlier age is not necessarily bad, but computers are not being used to teach children to think in sound ways.[25] Creativity is reduced to technique. Wisdom is reduced to a bottomless well of data accessed, manipulated, regurgitated but rarely reflected upon. This is a product or side effect of forces that pre-date the entry of computers in education, but computers may intensify the problem.[26]

Piety

The second basket of concern involves the life of the Spirit. We live in a consumer society. Greed has become a norm. Amidst the noise of advertisers hawking their wares, it is difficult to accept that there are any limits to commercialism. It takes a special consciousness to counter the many advertisements that tell us, 'You cannot be happy unless you buy this' or 'You are a nobody unless you own this.' It is difficult to put things in right perspective. What we are grateful for, we cherish. As a whole, North Americans are preoccupied with money. We are people in a rush. We are people addicted to size. We are people who exalt youth. Yet we are people experiencing the breakdown of community, the degradation of the self-worth of people and the apotheosis of things. Despite material prosperity and a boom in religious activity, a malaise of modernity infects many individuals.

Among most insightful recent analyses of life in the United States is *Bowling Alone* by the sociologist Robert Putnam.[27] The title derives

24 David Nobel is a major proponent of the deskilling thesis. In *Forces of Production: A Social History of Industrial Automation* (New York: Knopf, 1984) and other books, Nobel argues management supports automation to replace highly skilled unionized workers. A 'friend' of seekers of truth, Ivan Illich updates his analysis of educational practice, *Deschooling Society* (New York: Harper, 1971), in a recent series, 'The Corruption of Christianity. Ivan Illich on Gospel, Church and Society', *Canadian Broadcasting Corporation Ideas*, January 3-7, 2000, Typescript 2000. Other critics include Sven Birkerts, *The Gutenberg Elegies. The Fate of Reading in an Electronic Age* (New York: Fawcett Columbine, 1994); John Taylor Gatto, *Dumbing Us Down. The Hidden Curriculum of Compulsory Schooling* (Philadelphia: New Society, 1991); Grant, 'Faith and the Multiversity,' *Technology and Justice*; Theodore Roszak, *The Cult of Information. The Folklore of Computers and the True Art of Thinking* (New York: Pantheon, 1986).

25 Shelley Emling, 'Children Are Losing Creativity, One Click at a Time', *Atlanta Journal-Constitution*, February 11, 2001 is one study.

26 When I used 'technology and justice' as key words, a search engine produced 951,000 titles!

27 Robert D. Putnam, *Bowling Alone. The Collapse and Revival of American Community* (New York: Simon & Schuster, 2000).

from finding that from 1980-1993 in the United States, league bowling decreased by 40% while the number of bowlers increased by 10%. This is not trivial. Eighty million Americans went bowling at least once in 1993, nearly a third more than voted in the 1994 congres-sional elections and roughly the same as claim to attend church regularly.

For Putnam, people bowling by themselves signals the decline of life in connection or association, seen as the heart of civic culture in the United States since Alex de Tocqueville reported on Democracy in America in the 1830s. By every measure Putnam details, we are becoming more individualistic, less committed to the common good and even less tolerant. Sustained by massive documentation, Putnam shows we have become a collection of objects without a sense of responsibility to the greater whole.

Why has this happened? Changes in family structure, time pressure, suburban sprawl and, especially, television are the main culprits. Putnam discounts residential mobility (steadily declining for the last half century) and computers as a primary cause. The trend towards loss of community, compassion and civic culture predates Internet! The pervasiveness of the computer revolution may intensify the trend. On the other hand, the primary effect of widespread ownership of home computers will be to strengthen existing social networks, as the telephone has done, or to provide a glorified television. It is too early to ascertain.

My experience is mixed. I use E-mail to keep in touch with family and friends. I use the Internet to access information and support farsighted causes.[28] But these same computer technologies threaten to overwhelm me. Am I being socialized to sanction an enormous expansion of an already frenetic pace of life? Am I unconsciously coming to accept homogeneity and mindless consumption? Am I being anesthetized by a phenomenon that is at once dehumanizing and enslaving? I hope not, but I agree with Putnam that it is now past time to begin to reweave the fabric of our communities.

In reflecting on my own experience, I am aware of the warning not to practise one's piety before others (Mat. 6:1). Still, God calls us to live holy lives as participants in the Divine Nature as persons who bear God's image and likeness restored by Christ (2 Pet. 1:4). This is done in community. The Body of Christ knows no solitary individual. Christianity is incarnational. Just as God became one of us in Jesus, we share Jesus by making him manifest in our lives as we bless, encourage, give testimony, heal, listen, love, strengthen and practise compassion.

By contrast, a group of editors of the religious press once sought to explain why guides to contemplation, meditation, prayer and other spiritual practices flood the market. They discovered their readership of how-to books on spirituality comes almost entirely from the upper income bracket of society. Their

28 With a click of the mouse, hunger, rain forest and other web sites contribute to good causes.

readers had virtually no interest in social justice. Similarly, National Public Radio recently reported a vast increase of religion web sites and chat rooms precisely due to their anonymity. These findings suggest that some forms of modern spirituality reinforce individualism and isolation and do not assist believers to order their lives in the light of God's concern for the marginalized and the lost.

Justice

A third basket of concern has to do with justice in several spheres: economic, social and political. With computers have come automation, the electronic office and homeworking. The record is mixed. Computer technologies are often introduced in the name of efficiency and the elimination of repetitive work. Many jobs have been lost. The loss of jobs is serious, but jobs have also been created, especially in such areas as computer science, electronics and telecommunications.

Since the Industrial Revolution, some individuals have accumulated enormous personal power through their control of resources and engines of change: communications, transportation and tools of mass destruction. We may be in the midst of another 'revolution', the transition to a so-called information society. Might the arrival of the new workerless, information society replicate patterns of the Industrial Revolution with vast accumulation of wealth on the part of a very few? Does this portend realization of a massive substitution of machines for human labour? Clearly, it is too early to say. The recent legal battle involving the United States Department of Justice and Microsoft recalls earlier struggles to restrain the 'barons of industry'.

The bitter experience of blue collar workers, African-Americans and women is one of massive technological displacement. Many of those laid off have not been retooled for the new economy and find employment in low-income, low-creativity service jobs. Computers do not specifically 'cause' this phenomenon, but they do strengthen the power of the economically privileged. Studies on the face of poverty reveal a growing gap between those that have access to technology and those that do not. Computers have a disproportionate high presence among information élites while those that are traditionally marginalized continue to fall behind.

A focus on gender reveals structural barriers for women. Some women cannot afford to purchase computer equipment or to pay for Internet services. This is especially true in the Two-Thirds World, but it is also the case in the United States, where the full impact of welfare reform legislation is yet to be felt. Approximately a third of the population is poor. So-called welfare reform has erected new obstacles to gaining public assistance, including job training for the new economy. As a result, women coming off welfare are unable to attain a level of income needed to live independently. Women also face a structural barrier in the schools, where women experience anti-gender bias in computer education. In short, while cyberspace may yet

prove to be an equalizer where race and gender disparities disappear, for now, 'electronic apartheid' reigns.[29]

Is there any sign of change in the direction of social justice? A number of the studies accent the role of the third sector (churches, non-profit organizations, neighbourhood-based organizations and the like; government and business are the other two sectors). The latest technological innovations are providing some individuals with increased freedom by making more time available for creative pursuits, community service and family, to say nothing of other good ends. The high tech/high touch formula holds out the promise that new technologies will empower individuals to build strong, self-sustaining communities able to withstand the forces that made the last century so destructive.[30]

Another justice concern arises in the area of environmental ethics. Many tout computers as creating a paperless society. This is not true for me; if anything, I have experienced a tremendous increase of paper. I acknowledge that this may be a product of upbringing and preference. I like to touch what I read! Moreover, I acknowledge that computers have made possible, economically and technologically, a less harmful relation of humans to the natural world, for example through recycling or through accessing information on appropriate and sustainable technologies. For example, I am part of a Mission Group of the Memphis School of Servant Leadership that is developing a place of retreat. We envision building a house of prayer using solar energy, information about which we have accessed by computer. I can network with organizations such as The Nature Conservancy and Sierra Club. More broadly, I can use the tools of technology and the wisdom of our elders to open self and others to cast a more 'loving eye' on the natural world about me, including that in the damaged lands of our cities, and struggle against the mass estrangement from things natural.[31]

Yet another justice issue has to do with the potential abuses of communication and information technologies, including Internet. Examples of questions raised include the following:

- security risks: credit card numbers have been stolen, grades in university records changed and erroneous information placed in consumer credit reports. The problem is not unique to computers, and we

29 Gisèle-Audrey Mills, 'Online Democracy', *Other Side* 33, 3 (1997): 41. For a local study, David H. Ciscel, *What Is a Living Wage for Memphis?* (Memphis: Center for Research on Women, University of Memphis, 1999). Marsha Siefert, George Gerbner, Janice Fisher, *The Information Gap: How Computers and Other New Communication Technologies Affect the Social Distribution of Power* (New York: Oxford University Press, 1989); Kimberly Marie Mackay, 'The Effects of Anti-Gender Bias Instruction on the Attitudes of Student Perceptions Regarding Computers,' Master of Technology in Education thesis, University of Dayton, 2000.

30 John Naisbitt, *Megatrends. Ten New Directions Transforming our Lives* (New York: Warner, 1982).

31 Robert Michael Pyle, *The Thunder Tree. Lessons from an Urban Wildland* (New York: Lyons, 1993); Sallie McFague, *Super, Natural Christians. How We Should Love Nature* (Minneapolis: Fortress, 1997).

may yet find ways to protect ourselves better.

- intellectual property rights: how can the work of artists, writers or scholars be protected?
- regulation: access of children to pornography has been restricted. Are there limits of freedom? When is censorship appropriate?
- privacy and electronic monitoring: computerized personal databases store vast amounts of information. Every time one uses a credit card, makes a phone call, sends an E-mail, logs on to the Internet, borrows a book from the library, pays a bill, personal details are recorded. Why are such details stored? Who should have access this to this information? What controls should exist?
- identity theft: the capacity of communication and information technologies to stimulate new images has raised concern about the apparent malleability of identity A *New Yorker* cartoon pictures Peter at the gate of paradise interviewing a prospective candidate for admission. 'You're not coming up on my computer. How long did you say you've been dead?'[32]

A final justice concern is the military use of computers. Since the Vietnam conflict, the United States has come to depend on ground-based and on-board computers in ballistic missile guidance systems, air defence systems and the exploration of space. Some seventy percent of all government research and development funds goes to defence and space programmes (which are interconnected). While there are civilian spin-offs, most military applications are highly specialized and have little commercial potential. The end of the so-called cold war promised a peace dividend. Instead, military personnel and the public alike could watch the action in two modern conflicts in the Gulf and former Yugoslavia from a distance, scarcely aware of the cost, the potential failing of technical systems and the continued massive deployment of nuclear, biological and chemical means of ruin.

What Criteria shall be used to Assess Technology?

Are these areas a few glitches yet to be fixed? Or are we on the cusp of an ethical revolution commensurate in scale with the scope and scale of technological change? In household economics, I am discerning when faced by decisions about a purchase or use of innovation. 'Do I need this?' 'What are the hidden costs (externalities)?' 'Will this purchase contribute to somebody's loss of a job?' 'How will it effect my life?' Such questions are the sorts of criteria by which to assess computers.

If we want human community to flourish and cohere within the common weal, we need to be concerned about the impact of technological change on the members of that community. The computer should not replace or disrupt anything good, such as family or community. If

32 *New Yorker*, 21 April 1997. David Lyon, *The Silicon Society* (Grand Rapids: Eerdmans, 1986); idem, 'The Internet: Beyond Ethics?' *Science and Christian Belief* 9, 1 (1997):35-45; idem, *The Electronic Eye: The Rise of Surveillance Society* (Cambridge: Polity Press, 1994) and, with Elia Zureik, *Computers, Surveillance, and Privacy* (Minneapolis: University of Minnesota Press, 1996).

'labour saving' computers undermine the local economy or lead to massive unemployment, these externalities may not be worth the cost. Thus, when computers are introduced, costs and benefits should be measured on the basis of the premium we place on human interaction and human labour. For example, computer automation may be deemed beneficial if it frees people to spend more time with people, or if it is cheaper and better than whatever or whomever the computer replaces. The computer should be purchasable near to home. The computer should be durable so that our land fill sites are not overwhelmed with our garbage. People of ordinary intelligence should be able to maintain them.[33]

Criteria by which I or any individual may assess the relative contribution for good or ill of an individual technology such as the computer differs from the wider arena of ethical reflection on technology as such. Like most other technologies, the effects of computers are very mixed. The consequences for earth require reflection and wisdom that goes beyond technology. Technologies that raise few ethical problems are those that serve us on a human scale, allow us to take responsibility for our choices and consequences, protect the integrity of creation, ease the burden of work, facilitate communication, protect confidentiality and privacy, enhance social justice and brighten our day. Memphis Theological Seminary is developing guidelines through which technologies are responsibly admitted, acquired and used. Some serious work lies ahead.[34]

Summary

Technological change is a reality. The consequences for humanity, especially in terms of meeting basic human needs (not simply survival and security needs, but the need to belong, the need for self-esteem and the need for realizing one's potential) depend on choices made in the creation, development and use of these powerful new tools. It remains to be seen whether technological change in the area of computers will prove appropriate to or beneficial in every circumstance.

New technologies and tools have given some persons great power. Will the consequences lead to a better world? The possibility exists, but only, in my view, if we show restraint and humility. Christian apologist C. S. Lewis warned in 1943, 'What we call Man's power is, in reality, a power possessed by some men which they may, or may not, allow other men to profit by … what we call Man's power over Nature turns out to be a power exercised by some men over other men with Nature as

33 Wendell Berry, *Another Turn of the Crank* (Washington, D. C.: Counterpoint, 1995), pp. 19-21; idem, 'Why I Am Not Going to Buy a Computer', *What Are People For?* (New York: North Point, 1990).

34 Carrie Beverly, 'Ethics of Technology in Education', http://rgfn.epcc.edu and Lester J. Pourciau, ed., *Ethics and Electronic Information in the Twenty-First Century* (West Lafayette: Purdue University Press, 1999). The American Academy of Religion and Society for Biblical Literature offers workshops on the ethics of technology.

its instrument.'[35]

The computer presents us with a grave spiritual challenge. To promote the common good, I pray that we may connect the potential and good of tools like the computer with our own fundamental intelligence and spiritual nature as well as with the wisdom of traditions and communities of which we are a part. Wisdom goes beyond technical knowledge. Let us think carefully about the consequences and limits of technology, including computers.

35 C. S. Lewis, *The Abolition of Man. Or Reflections on Education with Special Reference to the Teaching of English in the Upper Forms of Schools* (Glasgow: Fount Paperbacks, 1978), pp. 34-5.