1. Religion and Technology: Where We've Been, Where We Are

It is common to discuss the relationships of technology to science, business, or medicine; it is rare to discuss the relationship of technology to religion (or to theology, the serious study of God, the sacred center of religion). When technology and religion are considered together it is usually with reference to how religion can participate in the "exciting new world of information technology." How much money should be invested . . . and on which computers and programs? How can we set up a web page and chat room? How can we jazz up our religious services by using multiple media and "karaoke" singing? Can we get a television show for our ministry? Shall we offer a "virtual church" service on the internet?  

This first set of questions is really asking how religion might rush to take its place in subordination to technological possibilities. What if we reverse the relationship and ask how technology ought to be interpreted and guided by religion? While the theology of technology is not normally Topic A anywhere, this is not to say it is an unknown subject. Carl Mitcham and Jim Grote edited and introduced a collection of twenty essays in their 1984 volume *Theology and Technology*---one hundred eighty pages of which consists of an annotated bibliography of some 840 articles and books relevant to the theology of technology.  

If we broaden our framework and terminology slightly, the discussion has many more participants of course. Recall, for example, Max Weber's famous study of the "Protestant ethic and the spirit of capitalism" and, more recently, Lynn White's influential essay tracing "The Historical Roots of Our Ecological Crisis" to Christian attitudes of dominion over creation. 

Two of the most important recent contributors to the theology of technology are David Noble and Jacques Ellul. Noble's book, *The Religion of Technology: The Divinity of Man and the Spirit of Invention,* is a careful historical study of the close relationship of religion and technology for the past one thousand years. During the first millennium of its existence, Noble argues, Christianity generally disdained the manual arts (i.e., early technology) in favor of otherworldly and spiritual matters. But during the Carolingian period, philosopher John Scotus Erigena and, more generally, the Benedictine movement led a profound change in Christendom's attitude. Technology began to be seen as an important means to the same goals as religion: salvation and the restoration of a fallen world. Technology acquired a dignity and value it had not previously had in either Classical or Hebrew-Christian thinking. 

While Noble emphasizes the roots of technological invention in medieval Catholicism, he could easily have added a discussion of Luther, Calvin, and Protestantism. Many of the most aggressive technological advances came in Protestant contexts and the connection is not accidental. At any rate, Noble's argument is that modern technology shares the same source, passion, motivation, and goal as religion. No wonder, he notes, that many of the greatest scientists and technologists have been outspoken religious believers at the very same time they were leading the scientific or technological charge. Technologists today may be less overt or conventional in their religious affiliations, but modern technology is pursued and promoted with the same messianic spirit, the same religious zeal, the same utopian dreams as always. 

Sociologist Jacques Ellul, some sixty years ago, began his lifelong analysis of the history and character of technology. His historical interpretation generally supports that of Noble: work and early technique were viewed by Jews, Christians, and pagans alike as toilsome necessities. Only in the modern world (though with some earlier roots) have technology and work been reinterpreted as "good," as part of image of God borne by human beings, as means of redemption in some sense. For Ellul, technology became not just a means employed by religion, it eventually began to function as a substitute religion in our allegedly secular world today. Technique is the new sacred, the locus of meaning and value, the object of adoration and sacrifice, and the hope of salvation. 

For Noble, as well as for Ellul, it is a priority for our era to desacralize technology. Whatever positive inspiration for technological progress may properly be credited to religion in the past, our situation today is
different. Today's exalted, transcendent visions of colonizing space or remodeling life through biotechnology are far too dangerous. Technology needs to serve more modest human goals and abandon its religious utopianism.

But is it enough to warn of the dire consequences of following a bad religion and a tyrant god? Will the people and the culture let go of their Technogod after reading Noble's or Ellul's brilliant critiques? Not a chance. A crucial strategy for the controlled, ethical guidance of technology is the articulation of a better theology of technology. Our recovery from bad theologies of technology will not be found by fleeing from the theological task, but rather by engaging it anew. Why is this so?

2. Why we need a new theology of technology

There are two reasons why a theology of technology is an urgent contemporary need.

2.1 Autonomous, divinized technology.

There certainly must be voices who assert the irremediably intrinsic evil of some, if not all, technology (though it is hard to hear them over the shouts of praise from technology's "amen corner"). More commonly, the fundamental problem of technology today is believed to be its autonomy. Technology does not seem to be guided by anything except its own internal imperatives (its curiosity, its agenda of problems and possibilities).

But the problem goes further than that: technology not only threatens to be (and often is) autonomous, insubordinate to other guidance—-it is imperialistic, ruling over other domains of life (calling the shots, setting the agenda, e.g., in medicine, business, education, religion). In this way, technology becomes divinized, it becomes a substitute god. Jacques Ellul alludes (by his book title "The New Demons" or "The Newly Possessed") to the Gospel story of an exorcism—in which a demon is evicted from someone, only to have seven worse demons occupy the spiritual vacuum. Ellul argues that the West managed to exorcise the "demon" of Christianity but, far from having a truly secular civilization, we are now more religious than ever—-worshipping technology (and also the state, sex, and money).

Thus, the first reason why new efforts toward a theology of technology are essential is descriptive and critical-analytical. If technology is, in practice, our god, let us face up to that relationship honestly, and then embrace it, modify it, elaborate it, or reject it with our eyes open. If technology is a worthy god, then we must find a replacement deity. Theology is reflection on such ultimate, final, transcendent purposes, ends, and goals. "God" is the historic name for this final End. Technology, a proliferation of means, is in need of the guidance of ends and values. There is a growing recognition that our rapidly expanding technologies, especially information- and bio-technology (but also weaponry, energy, transportation, and other areas), are out of control, or nearly so. The great questions are "what greater purpose will these technologies serve?" and "what moral values will guide us in the development and use of each of these technologies?"

2.2 The silence and errors of theology.

The second reason why we need a new theology of technology is the frequent silence or error of our existing theologies on the subject of technology. Millions of religious believers have decided who their God is—-but a theological understanding of technology has remained unarticulated for them. The consequences of such a theological silence concerning technology are great. Vast throngs of believers go to their work as theological and moral infants, wholly unguided and unprepared to contribute anything to a technological world desperately in need of wise guidance.

Some work, of course, has been done on the theology of technology—-but is simply wrong-headed and in need of correction. For example, Christianity has often been charged with justifying the domination and exploitation of the earth (its natural resources, animals, people, etc.) because of a hierarchical worldview in which God is all-powerful and otherworldly and humans are commanded to have dominion over a world of objects, of value only insofar as they are useful to humans. When this caricature of biblical theology is presented we can almost see the bulldozers, factory animal farms, and smog-belching industries arise before our eyes. Such a caricature is maintained primarily by the antagonists of biblical religion. but,
regrettably, they have been given much ammunition by believers who have a defective theology of technology. Even such a thoughtful and formidable theologian as Jacques Ellul has misread the biblical message in certain ways.9

3. A Seven-Point Prolegomenon to a Theology of Technology

In short, technology needs theological guidance; it cannot serve very well as its own god. And theology has its own internal imperative to address technology; theology is reflection on the ultimate sacred, center of life and meaning and value, and it cannot rest in silence or error with respect to technology, the dominating force in contemporary life.

What follows will be seven points of prolegomena to an adequate theology of technology. Each point begs for deeper discussion and criticism, of course (this is a prolegomenon, not the end product). Prolegomena are not just an exercise in frustration, however. They may provoke helpful discussion, challenge others to do it better, and give some hope to those who thought a theology of technology was impossible.

What follows will be prolegomena to a Christian theology of technology. Few (if any) people practice "religion-in-general." Instead people practice particular versions of Islam, Hinduism, Christianity, and so on. So what we will need are (not one, but several) theologies of technology. My concern here is primarily with a Christian theology of technology. There are, of course many varieties of Christianity, but there are some common themes that could be helpful to all denominations.

"Technology" is not, of course, a term in the Bible. Further elaboration and justification will be necessary but for this prolegomenon let it be said simply that technology is a form of human activity and work. It is human activity intending to change the world, to achieve practical objectives (e.g., farming, organizing, manufacturing, traveling). As such, a theology of technology is closely related to a theology of work.

3.1 Three Sources & Authorities.

A Christian theology of technology will need to be rooted in three basic sources or authorities: the Bible, the Christian community (or the Church), and lived experience, in that order. These three authorities provide the three tests for the validity of a theology of technology.

To say, first, that a theology of technology must be based primarily on the biblical text sounds very Protestant and even Fundamentalist or Evangelical. Nevertheless, the Bible is what Catholics and Protestants have in common. There are differing traditions, histories, and organizational structures among Christian groups. Not all Christians approach the Bible in the same way; not everyone views it as the infallible word and revelation of God. Nevertheless, the Bible is an important, central authority for virtually all Christians. Christians can find common ground in biblical study---much more than in liturgy, organizational structure, or history.

Another reason for emphasizing the authority of the Bible is that the largest, fastest-growing parts of the Christian movement tend to be Evangelicals and Pentecostals for whom the Bible does have extraordinary authority and respect. A biblically-based theology of technology has a better chance to be helpful to large numbers of practicing Christians than any other kind.

But the Bible is not a self-interpreting message to isolated individuals. Despite the influence of Enlightenment and American individualism on Christian thought and practice, biblical Christianity promotes the authority of community in some important ways. The creation story in Genesis reports God saying "It is not good for one to dwell alone"---and then making man and woman together in partnership in the image of God. Jesus sent his disciples out "two-by-two," not "one-by-one." St. Paul said that all Christians are "members/parts" of the mystical "body" of Christ, essential to its functioning. So a theology of technology cannot just be grounded in the biblical texts---it must respectfully draw on the insights and convictions of Christian throughout history and throughout the world. Everyone will not agree on the theology of technology---but voices from all eras, all regions, and all traditions must be heard.
Third, a theology of technology must be practical, not just theoretical. It must come to terms with reality, not just with truth. Christianity is centered on incarnation—on God taking on human flesh. It is not about a flight to Platonic Ideas or contemplative, theoretical knowledge. “Let your faith show itself in your works,” St. James says. All too often, theology (not just of technology) has been a conversation piece for professional, ivory tower intellectuals. But a theology of technology must be practically applicable in the daily world of technology—or it is not truly Christian.

3.2 Technology, creativity, and the image of God.

For a biblical theology, the original and true sources of the human technological imagination are described in the early chapters of Genesis. Recall the accounts in Genesis 1-2. (1) God created; God made the heavens and the earth. (2) God’s creativity gave form (shape, order, design) to what was “without form”... filled what was “void” or empty... and illuminated the darkness. (3) What God made was “good”... “useful”... and “pleasing to the eye.” (4) What God made was diverse, complex, awesome in scope, orderly, and also free. (5) God rested after finishing this creative work. More could be said but these are the major characteristics of the work of the Creator God.

Human beings are made in the image and likeness of precisely this creator God—and the first and basic source of our own creativity is this fact of our nature. Human creativity and technology are first of all an exhibition of our nature. This is why we are driven and inspired to make things; this is why it is profoundly dehumanizing not to have a job or an outlet to express such creative work. It is often profoundly gratifying to invent things, to make things, to create. Why? It is embedded in our human nature.

Secondly, work (and technological creativity) is also a response to the command and invitation of God. The free choice of obeying God’s command also underlies technological activity in a biblical theology. God commands: “Be fruitful and multiply”... “Fill the earth and subdue it”... “Have dominion”... “Till and keep the garden”... “Name the animals.” Each of these phrases deserves careful exegesis and interpretation, of course, but it is mind-boggling to think that such words of instruction from God—within the texture of the creation stories and seen against the backdrop of humanity bearing the image and likeness of the Creator—could be viewed as either (a) providing a license to exploit and pillage the earth through technology (Lynn White), or (b) irrelevant to the meaning of our work and technology (Jacques Ellul).

To be sure, the biblical story proceeds to a terrible “fall”; humanity is driven out of Eden and barred from ever returning. Thus a biblical theology of technology must never harbor fantasies about a return to the garden and a utopian Edenic innocence. Nevertheless, the rupture is not absolute; humanity is not left in the garden but they are still in the world God created; the image of God is still embedded in man and woman; the same Creator God still pursues and accompanies man and woman; the heavens and earth still show forth the glory, the nature, and handiwork of God (Psalm 19; Romans 1); and in the future New Jerusalem God will be worshipped for Creation—as well as for Redemption (Revelation 4 and 5).

At its best then, our technological creativity continues to bear witness to God’s creation—when it puts life-affirming order on chaos, when it fills important needs, when it sheds light in the darkness, when it combines innovation harmoniously with what already exists as good, when it contributes both beauty and utility to the world, when it allows both individual uniqueness and partnership/community to flourish, and so on. Technology is an expression of human creativity and imagination in God’s image and likeness, of doing and making good and helpful life-enhancing things. While there is plenty of biblical material emphasizing the spiritual and inward over the material and external, this is balanced by passages affirming the concrete, external world of things. For example, the Old Testament describes in detail the materials, dimensions and building techniques for Noah’s ark, Moses’ tabernacle and Solomon’s temple. In a classic text, a master craftsman, Bezaleel, is sent to Moses by the Lord who says “I have filled him with the Spirit of God, in wisdom and understanding, and in knowledge, and in all manner of workmanship” (Ex. 35:30ff.).
3.3 The freedom and limitation of good technology.

A crucial additional consideration is that in a biblical worldview technological and creative work is guided and bounded in four ways. Technology is an expression of freedom and creativity but not of unguided chaos. In the Genesis text God says to Adam “You are free . . . but you must not . . . ” (Gen. 2: 16-17). Freedom/permission and boundaries/limits go together. Creative freedom will not flourish without limits.

First, creative human work/technology is launched by the word of God. Creation itself begins when God says “Let it be...” Human work begins when God says ”Be fruitful ...fill...subdue... till...keep... name.” It doesn't begin out of idle curiosity, boredom, greed, or lust for power. There is something natural, spontaneous, even intuitive about technology, but this is accompanied by the clarifying command and commission of God. Thus, Christians should not pursue technological projects unless they (with their Christian partners---this is not a Lone Ranger religion!) can clearly see that the project is in continuity with the creative purposes and commands of God. Many technological activities will be harmonious with the example and word of the Creator---but some will not.

Second, creative technology and work is bounded temporally by the sabbath: God rests on the seventh day (and so do those made in his image). There is a time to cease from technology. There is a time when God (and God's creatures) could work---but do not. Our theology of technology must address this issue of time. Is all time (ours, our family's, our company's, our church's, etc.) to be invaded and dominated by our work? by our technologies? Is there no sabbath, no break, from technology? This is a critical boundary condition in need of rediscovery and articulation for our era. It was already clear in Jesus' time that any legalistic formula for sabbath observance was neither desirable nor possible. But the principle remains! The week must include some sabbath rest from regular work.

Third, creative work and technology is bounded spatially in that there is a tree at the center of the garden that is not to be harvested for food; a limit is respected. There was a tree that could be harvested but must not be. There are spatial limits which technology should not transgress. What are these limits today? No easy answers are possible but the theological principle is that some spatial limits must be determined and respected. Should we invade the human genome and tamper with it? to cure disease? to modify personality? Should we invade the planets? outer space? and discard our junk there? and set up surveillance systems of all types? Should we set any limits to advertising? to noise? to smoking? or fluoridation of public water supplies? Today's technology is dangerous partly because it recognizes no limits of this kind. Money alone sets limits on what is done. The motto of today's technology is "if it can be done, it will be done."

Finally, creative human work was bounded ethically in that man and woman were commanded not to consume the fruit of the "ethics tree" (the tree of the knowledge of good and evil). Humans were to live and work in relationship to the God who sees and names the good---they were not to try to take this ethical knowledge for themselves outside of this relationship with God (i.e., to seek an autonomous ethics). The world God created was characterized by goodness as the fundamental category of ethics. A theology of technology will entail an ethics of technology that (1) concentrates on discovering and elaborating the goodness of technology reflecting the words and acts of God (i.e., it is not dominated by nay-saying debunking of the evils of technology---identifying and resisting evil technology is important but secondary), and (2) invites the ethical judgment of God on our technology and resists the urge to be the masters and judges of our own goodness and righteousness. Technology is no more morally/ethically neutral than anything else in the world. The world is value-laden.

3.4 Autonomy, idolatry, and bad technology.

The "fall" occurs when man and woman misuse their freedom, breech the boundaries, grab for the fruit of the "ethics tree," and hide from God in shame and fear. The human situation changes dramatically. They bring a curse on themselves---alienated from God, the earth, each other, even the self. They are evicted from the garden and cannot go back.

A theology of technology begins by trying to understand the goodness of creative technology and the boundaries and conditions in which it can flourish. But it must proceed to understand how technology is participates in, and is affected by, this fall. How and why does technology now sometimes become
perverse and violent? How is it that a Dachau is built next to a Munich by the same technology.
Technology always threatens to become idolatrous and autonomous.

The major problem arises when God is hidden, ignored, or rejected---and technology is treated as sacred, when it moves to the center of life, receives sacrifices, bestows meaning, direction and significance on human activity. When technology becomes omnipotent, omniscient, omnipresent, and the producer of awe in our lives, it has displaced God and we are guilty of technological idolatry. We have begun to worship the work of our hands. We are guilty of pride and of exalting the work of the creature over the Creator.

What should be carried out in a living relationship to God, subordinate to the character and plans of God, is now autonomous, subject to nothing except its own internal imperatives. Such technology carries with it no respect for nature, social tradition, religious authority, the absurd or paradoxical, the weak and unproductive. And yet all of the foregoing are part of the world God has created.

3.5 Redemptive and healing technology.

Because of this "Fall," this radical disruption of creation, the creativity motifs in a theology of technology must now be augmented by, even caught up within, motifs of redemption and healing. This means that in a fallen, broken world we are not able to act naively. We do not begin our technological day with a tabula rasa, a clean slate, inviting our technological creativity.

We must take account always of the potential for deception and destruction in our work. Redemption means that our work (our technology) must aim at liberating what is imprisoned and in bondage. Healing means repairing what is broken, overcoming what is diseased, relieving what is hurting and suffering.

Our technology must now preserve what is degenerating and conserve what is disappearing. Creativity, illuminating, ordering, filling, naming---these original motifs of creation continue, but the arena is no longer pure and innocent. Sacrifice, servanthood and humility will need to characterize a redemptive technology. Technology cannot just be about conquering new frontiers and about adding to the tools and toys of the healthy; it must now also be about repairing the devastation of older, former frontiers, setting free those addicted to toys and misusing tools, healing those injured and sickened by our civilization.

3.6 Ends, means, and eschatological Technology.

Our theology will also require an "eschatological" technology. "Eschaton" is Greek for "end"; "eschatology" is the study of the future, the final things, the ultimate End. Technology is a development and perfection of means---tools and methods. As Thoreau once said, "our inventions are but improved means to an unimproved end." Our technological civilization has developed powerful means of all types imaginable. But these means have been developed without adequate attention to the proper ends of human life; they have become ends in themselves. 13

Christian life is eschatological life: it is life lived in expectation of the coming End, the future consummation of God's kingdom and purposes. The Holy Spirit, St. Paul said, is given as the pledge, the "down payment," on the future inheritance of Christians. Christians thus "lean toward" God's future. They live, as St. Paul put it, "in the night" but "as in the day," "putting aside the deeds of darkness and putting on the armor of the light" (Rom. 13:11-14). Thus, a theology of technology requires a rigorous assessment of the true ends of human life. In the light of these ends, specific technologies can be assessed and evaluated. Technological means must not be self-justifying. They must be justified by God's end, and then they must exhibit the character (not the contradiction) of that End.

3.7 Effectiveness, Faithfulness and Technology

Finally, a theology of technology must recover the notion of fidelity. Fidelity means faithfulness, loyalty, steadfast commitment, clinging and attaching yourself to something. Fidelity or faithfulness is a very prominent theme in the Bible. It is in stark contrast to effectiveness---one of the core characteristics of technology.
Fidelity (faith, faithfulness) is first of all directed toward God. After the fall of Adam and Eve, God continues to speak to humankind even though there are barriers between them which make the process of hearing God more difficult. Often the word of God takes the form of a question: e.g., where are you? what have you done? where is your brother? who do you say that I am? Faithful technology will hear God's commands and his questions, inviting them, seeking them as not only the starting point of our technological activity but its boundary. It will seek to contribute to God's purposes for life in the world, trying to discern and respect appropriate limits and boundaries in space and time.

Fidelity to God means fidelity to the Good, trying to hear God's ethical judgment on our projects instead of pronouncing our own. It means overcoming evil with this good, contributing to this good. Fidelity to God means fidelity to the Creator but it also means fidelity to the Redeemer. Faithful technology will not just be fruitful, fill, subdue, create, name, till, and keep---it will go into all the world, love neighbors and enemies, heal the sick, set free the captives, comfort the lonely, and welcome the children."

Fidelity also must govern our relationships with others. We are created not to be isolated individuals but to be in relationship to others; "it is not good for one to dwell alone." Faithful technology will not subordinate people to technique. It will express faithfulness to partners, neighbors, friends, and fellow humans. It will promote technology on a human scale. It will not reduce people to technical categories, not try to adapt people to the requirements of technology. It will invite others, community, to help rebuild the boundaries and discern and support good technological work.

Our modern choices with respect to technology are symbolically represented by the Tower of Babel and Abraham's altars (Gen 11-12). The technology of Babel intends to make a name for the self, make security for the self, breach all limits, choose and occupy its own chosen place. But the technology of Abraham builds an altar for God, lets God care for our reputation, protect, and guide us to the place he chooses.

A theology of technology shows that we can't go back to Eden. We must go forward either to Babylon, where Babel's project is fulfilled, or to the New Jerusalem where Abraham's project is fulfilled. The afterlife is depicted in the form of a city, not a new garden of Eden, into which the nations bring their glory. Technologists who are guided by a theology such as the one we have sketched here, will pray and work that something of our own generation's technology will be worthy of a place in that city of God.

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5Of course, it is not absolutely clear which came first historically: technological innovation or theological rationalization. It works both ways: religion enables or encourages certain cultural or technological developments; religion trails and conforms to certain cultural or technological developments.


This was a prominent theme in Jacques Ellul’s work; Langdon Winner, *Autonomous Technology* (Cambridge MA: MIT Press, 1977) has written the outstanding discussion of this subject.

See “Technique and the Opening Chapters of Genesis,” in Mitcham & Grote, *Theology and Technology*, 123-137. In this article and elsewhere, Ellul insists that the activity of man and woman before the “fall” in Genesis has *nothing* to do with our experience or understanding of work or technology. For Ellul, work and technology are only to be understood as sinful necessities in a broken world. He could never see it any other way.

I would want to include various versions of Americanism, Marxism, scientism, materialism/consumerism, racism, and so on, in my larger list of religions.

I am not being innovative or eccentric here; Mitcham, Schuurman, Ellul, Monsma and others develop a theological interpretation of technology in close, sometimes indistinguishable, association with a theology of work. Technology is a particular form of work, of course, distinguishable by tools and methods of a rational, artificial, and efficient character.

There is good sense in beginning to re-establish temporal boundaries by working at our weekly (rather than daily or monthly or longer) schedule. The two versions of the Ten Commandments root the meaning of the Sabbath Commandment in both Creation/Rest (Exodus 20) and Exodus-Slavery/Liberation-Rest.

The popular technology/business book by Michael Hammer and James Champy, *Reengineering the Corporation*, explicitly recommends that business leaders see what new technologies “enable,” or make possible, and then pursue those directions—rather than simple “automate the past.” There is some good insight here but we should not overlook the subtle change that is occurring. Something new is in the driver’s seat.