"Technology" - Reading the Signs of the Times

John M. Staudenmaier, S.J.

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“Technology”—
Reading the Signs of the Times


Readers of Conversations—the faculty, staff, and administrators who make Jesuit colleges and universities go—can find some help in understanding what all of us do by attending to the injunction of Jesus “to read the signs of the times” (Mt. 16:2). I want to suggest that we should consider as a very important sign of the times our commonplace use of the word “technology,” by which I mean both technologies themselves and how we come to think of them in the aggregate.

Gradual Conversion and Jesuit Education

Before turning to an historically based rumination on how technology operates in our culture, I want to argue very briefly a theological premise that links reading the signs of the times with some specific characteristics of Catholic and Jesuit higher education. I do not mean to argue that this premise is unique to Jesuit and other Catholic schools, only that it resides at the theological core of our educational tradition and we do well to remember it when engaging in reflective exercises like this. The premise is deceptively simple: For Catholicism, gradual conversion is more important for the processes of grace than radical moments of conversion. Catholicism, with its emphasis on grace and forgiveness, assumes that we never perfectly embody faith in God. Gradual conversion is a process of learning, repeating, and beginning all over again, implies that my culture is not something to escape once and for all, into a new world of faith that takes shape in the twinkling of the grace-filled eye. This theological premise is important for several reasons. Our lives are embedded in a culture which deeply affects, shapes, and challenges our lives. Lasting conversion cannot occur without a thoughtful awareness of this fact, and no single or sudden insight can achieve this awareness.

I do not find it surprising, given this Catholic predilection for gradual conversion, that Jesuit education has been marked all through its more than four centuries by affection and respect for the world, by a commitment to engage in and learn from the world’s traditions. Still, loving the world cannot mean uncritically drifting with societal trends. If I love the world as someone engaging in gradual conversion, I must learn how to read culture in a discerning manner. The question is how to love my culture and my world so that I recognize which of its inclinations to resist, which to treat as distractions, and which to receive as graces. When should I be prophetic? When appreciative? Helping our students to form the habit of asking and answering such questions is an important goal of Jesuit higher education. Without the habit of discerning one’s culture, our graduates are in danger of following an all-too-common trend: they will come to see themselves as adults in private, but as passive drifters in the public order. Consequently, they will fail to participate fully in that part of the public order where decisions are made to allocate resources along some lines of technological development and not along others. It is not easy to

John M. Staudenmaier, S.J., is professor of the history of technology at the University of Detroit Mercy and editor of Technology and Culture, the international journal of the Society for the History of Technology.
learn to understand oneself as a decision-making adult in the public order. Careful rumination about our culture’s ambivalent depictions of technology can help us grow more discerning about one of the most powerful mythologies of the late twentieth century.

**Two Symbolic Meanings for Technology**

We need to consider not only how technology affects and shapes our lives but also how we tend to think and talk about it. We have become accustomed, in the United States, to absorbing two sorts of symbols about the nature of technology. The symbols operate at such a level and conflict so sharply that Americans feel the allure of passivity as a seductive alternative to more adult responses. One symbol set tells us that there exists a powerful, godlike force, called “science” or “technology,” that was set loose during Europe’s scientific and industrial revolutions. By our science and technology we human beings set ourselves free from the burdens that nature laid upon us. We live longer lives, have better health care, move our selves and our freight about at vastly superior speeds, trade information around the globe at a previously unthinkable pace. Science and technology represent a liberated humankind, conquerors of space, time, sickness, and death itself. The images that accompany this symbol set typically evoke what we have come to call “high-tech”: computer graphics, high-glace color tones, and music more like Beethoven’s Ninth Symphony than Mahler’s Requiem.

The second symbol set tells us that the dream just sketched has fallen apart, that our technological systems are beginning to disintegrate, that they brought with them many more problems than they solved, and that we are drifting ominously toward ecological and societal disaster. Worse, these symbols warn us that none of us, as individuals, has anything to say about what happens anyway. Progress, it seems, has no master but its own autonomous inner demon. There isn’t anyone to blame for all the trouble but ourselves and we aren’t even in charge. Perhaps the archetypal symbol here is not the crumbling highway or devastated inner-city corridor, but the Wizard of Oz. American to the core, the wizard seeks to ward off the little troop of suppliants with the now famous injunction: “Pay no attention to the man behind the screen.”

Who does not recognize the immense frustration of not being able to get at the designers of an oppressive system? The bank’s computer records glitched and my credit rating is a mess because somewhere someone (or something?) told the computer that I do not pay my bills. One finds little satisfaction attacking the low-pay clerk who sits out front. The woman working the supermarket’s endless check out line, in which I stand fuming, did not set the policy that has only two registers open instead of the six needed for the crowd. Can I blame her? A box in my living room that arranges electromagnetic signals into colored shapes and various noises frequently projects savagely crude or unbearably banal advertisement into my home. What good does it do to shout at it in protest?

Why—here lies the seduction—shout at all? More to the point, why do anything about any of the technological structures that
intrude on and organize our lives? The virulence of this alluring
drift toward numbness was captured in appropriately blunt lan-
guage in the central document of the Jesuits’ Thirty-second
General Congregation in the early 1970’s, “Our Mission Today”:

Too often we are insulated from any real contact with unbe-
lief and with the hard, everyday consequences of injustice
and oppression. As a result, we run the risk of not being able
to hear the cry for the Gospel as it is addressed to us by the
men and women of our time. (Paragraph 35, my emphases)

The same soft voice that whispers our technological, political,
and societal ineptitude offers us too easy an absolutism for the vio-

lence we see working in the lives of “the men and women of our
time.” Passive apathy in the face of autonomous progress simulta-
neously erodes our capacity for kinship with those around us and
our sense of holy pride and adult responsibility for the techno-
logical works of our collective hands. This essay will try to make
some sense of this symbolic state of affairs and, in the process,
serves as an invitation to risk-taking steps along the path of adult
public citizenry in—and with holy affection for—the wide world.

Technological Style

To understand the origin of these two symbol sets we need first
to think about how a given society generates a technological
“style.” No successful technology—not the moving assembly line,
not nuclear power plants, not television, not even a new cosmetic—
ever came into being as the result of an inevitable progressive
force. Human beings with their tangled motives decide which
designs are attended to and which ignored. Real people, com-
manding the limited resources of the working world, decide
which technologies will be invested in and why they take the final
shape they do. Money spent on concrete highways will not be
spent on rail lines. Engineers trained to design nuclear weapons
do not get trained in hazardous waste removal systems. Choices,
not magic, shape technological style. This maxim, the central
tenet of the history of technology, provides a basis for under-
standing technological style.

Because a technical design reflects the motives of its design con-
stituency, historians of technology look to the values, biases, mo-
tives, and world view of the designers when asking why a given
technology turned out as it did. Every technology embodies some
distinct set of values. To the extent that a technology becomes suc-
cessful within its society, its inherent values will be reinforced. In
this sense, every technology carries its own style, fostering some
values while inhibiting others. In the technological view of history,
tradeoffs abound. There is no technological free lunch.

To take the matter one step further, we might note that those with
access to the venture capital that new technologies always require
tend to be people who hold cultural hegemony in their society.
“Holding cultural hegemony” means belonging to that group of peo-
ple who shape the dominant values and the superordinate symbols of
a society. This group is often a single historically fixed group—as
a technological conspiracy theory might suggest—they do tend to
view the world from the same perspective. Consequently, we can look
for a set of successful technologies that, in any relatively stable era of
history, embody the technological style of their society.

From Negotiation to
Standardization

The technological style that gradually became dominant in the
United States through the late nineteenth century and the first
decades of the twentieth has one pervasive characteristic. The
many successful technologies that make up “The American Style”
share a commitment to solving problems by designing highly
complex standardized systems. Standardization came to be seen
as preferable to the more political processes of negotiation.
Consider a few highlights of the history involved. Until 1870 or
so the challenge of conquering the wilderness shaped the domi-
nant technological style in the United States. As generations of
men and women from Europe or the more settled Eastern United
States headed west, their longing for a “middle landscape,” a liv-
able place carved out of the wild, grew into a central symbolic ele-
ment of the American character. Fifteen-hundred miles of virgin
forest, another one thousand of prairie, the Rocky Mountains, the
Sierras, and the intervening deserts—the land itself inspired an
American dream. To the eyes of everyone but Native Americans,
it was empty of history but full of both promise and danger, a
manifest destiny challenging the best people had in them.
Building a human place, clearing fields and rivers, constructing
homes, roads, canals, bridges, tunnels, and cities preoccupied the
 technological imagination. Americans honored technical expertise
as “knowhow”—a blend of often crude rules of thumb, occasion-

al engineering elegance, courage, and an intimate knowledge of
local terrain—as the context whose constraints defined the limits
of every project. Technological style, then, demanded a continual
negotiation between the skills, tools, and plans of white
Americans and the godlike wilderness they sought to conquer.
Despite their passion for freedom and individualism, Americans
found negotiation a basic necessity in human interaction as well.
People needed one another in an “empty” land.

Lest we idealize the American conquest of the wilderness we
should take note of the place of Native Americans and African
Americans in the myth of the middle landscape. Native Americans
were part of the wilderness, simultaneously godlike in their abil-
ity to negotiate the forbidding terrain and sub-human, lacking cul-
ture and history. African Americans, on the other hand, were part
of the tools that white Europeans used to conquer the wilderness.
Neither image, of course, comes even close to the self under-
standing of these two peoples.

Long before this technological style fell from preeminence, how-
ever, a successor began to exert its influence. Beginning in 1815
with the U.S. Ordnance Department’s commitment to standardized
uniformity in weapons production, a new technical ideal gathered
momentum in the land. The new ideal embodied a radical shift in
values. The older style’s negotiation with nature and with co-work-
ers shifted toward standardization’s conformity to precision design.
and centralized authority. The new American factory system turned out a host of new products, and in the process transformed the relationship between manager and worker from the sometimes respectful and sometimes tumultuous interaction of the early American small shop to a more impersonal enterprise, characterized by heavy-handed enforcement of work rules. Automated machines increased the divide between management and worker, and the workforce became increasingly unskilled. The transformation was hardly limited to the factory. Little by little, a broad range of technological endeavors began to adopt the standardization ideal, as the three brief examples that follow will show:

Railroads evolved from a turnpike model—state-owned and supported roadbed—to a centrally owned enterprise that included roadbed and most system components. In the process, the relationship of railroads to their surrounding context changed dramatically. Historian J. L. Larson contrasts the design of grain shipping facilities in St. Louis and Chicago in 1860. The St. Louis design demanded bagging the grain, loading it on train cars, offloading it at the outer edge of town where the tracks ended, transferring it across the city, and loading it again onto river boats. The Chicago design permitted bulk loading on grain cars because the track ran all the way to the docks where it was off loaded onto grain boats. Larson concludes his description with a provocative sentence:

If the Chicago system was a model of integration, speed, and efficiency, the St. Louis market preserved the integrity of each man's transaction and employed a host of small entrepreneurs at every turn—real virtues in antebellum America. (my emphasis)

The St. Louis set-up required negotiation as part of the shipping process while the more complex and capital-intensive Chicago design achieved greater efficiency and permitted railroad management to ship grain without needing to negotiate with that "host of small entrepreneurs at every turn."

The geographical and managerial complexity of the railroads fostered standardization in many ways. The railroads' need for precise timetables transformed a land of multiple, local times into 1885's single system of standard time divided into our familiar four time zones. The depot, that little building where town and rail line met, gradually evolved toward a standardized architecture that reflected the triumph of the railroad system over local style. Railroads required the telegraph to move information along their far-flung network. Their heavy investment in telegraph innovation and national transmission lines fostered in turn the "wire" services. Speed-of-light transmission lines opened the way for national and later global networks that came to dominate the media with their standardized accounts of news from far-flung places.

We see the same trend in the changing character of electrical systems. If we lived in a small town in 1890 and held a town meeting to decide whether to buy some electricity, our debate could lead to a "Yes" or a "No." If "Yes," we would shop among the three manufacturing firms—Thompson-Houston, Edison General Electric, and Westinghouse. Once installed, the system would be ours, a tool we had purchased to serve our needs. We townsfolk were independent with respect to the technology. We could take it or leave it, and we could purchase one or another type as well. Today our little town no longer maintains this independent position. From the perspective of electric systems management, our town serves as a functional component. We no longer "negotiate" with the electrical technology. Our dependence on electricity together with the complex requirements of generation and transmission systems has changed the earlier negotiated relationship to one of conformity.

A major redefinition of advertising, just after the first world war, extends the pattern. Beginning in 1923, with the arrival of Alfred P. Sloan as president of General Motors, the task of marketing new cars shifted from Ford's approach, stressing the economy and technical competence of an unchanging Model T, to fostering cyclic dissatisfaction with one's present car, the basis of "turnover buying." Continued expansion of the mass-production system required turnover buying for, as the recent automobile recession demonstrated, when owners keep their cars for too long, the new car market stagnates.

Sloan's marketing strategy at GM was only the most striking example of an extraordinary shift in the nature of advertising after the first World War. Mid-nineteenth-century advertisements tended to take the form of a dialogue that assumed a basic equality between advertiser and reader. With the notable exceptions of patent medicine and P.T. Barnum-style enticements, sales were thought to result from a rational description of product qualities or a simple announcement of available merchandise. By the early twentieth century, however, gradual changes in strategy began to coalesce in a new style focusing, not on product, but on what the product could do for the buyer. Emotion began to replace reason in the preferred rhetorical style. Premier ads tried to shape audience preferences and wants according to corporate marketing strategies by creating a sense of personal inadequacy and discontent as the basis for impulse buying. Consumerist marketing does not work with money-conscious shoppers who tenaciously negotiate every purchase or who stay home content with what is already there.

Consumerist advertising marks the epitome of standardization's assault on a negotiation style of doing business and solving problems. Whereas the Ordnance department tried to standardize musket parts and the work patterns of skilled armorers, and whereas centralized railroads later in the century began to standardize equipment and to expand corporate control over previously independent entrepreneurs, the new form of marketing tried to extend standardized conformity into human motivation itself. It did so, we should observe, primarily in the symbolic universe. The business of the twentieth-century advertisement, the technical task each one is designed to accomplish, is to borrow some symbol from the culture at large and to craft an advertisement that will bond that symbol to a product so that the product can share in the power of the symbol. The underlying utilitarian technique, using cultural symbols to move product, operates whether the symbols in question are grandma and grandpa welcoming you home for the holidays (while fondling Kenmore kitchen appliances) or sensuous and erotically athletic couples grinding for Jordache jeans.

These three vignettes indicate a radical shift of the values embedded in our normal technologies and of the symbolic
valence attached to them. Until the late nineteenth century, technology meant something like the following: "Tools and skills that we make and use for their purposes." The emergent style of standardized technologies, however, shifted that meaning to something more distant from ordinary human agency: "Elegantly designed systems on which we depend for our survival." Twentieth-century systems tend to resolve the old problem of peers negotiating with one another by bringing once independent negotiators inside the system as functional components.

Three examples do not do justice to the scope of this value shift. I have hardly mentioned our changing relationship with nature. Thus, a century-long avoidance of waste disposal problems, seen so vividly today in acid rain, deforestation, toxic dump sites and the like, reveals a consistent pattern of overriding or ignoring nature's constraints. Only recently has the majority of Americans begun to recognize that nature "has a say" in the technological endeavor.

Make no mistake, however. Standardization yields substantial benefits. Standardized mass production permits a much larger segment of the population to own relatively high quality manufactured goods, improving the standard of living for poor as well as rich. More important, standardization fosters and rewards the virtue of precision measurement and design. Living as we do in an age where elegant systems such as telephone networks, electric utilities, medical technologies, and computers are commonplace, we find it hard to imagine a world where the art of making steel seemed almost magical. Precision design has joined the family of the elegant arts even as it makes possible the systems on which our communication, our health, and our productivity depend.

Standardization carries significant liabilities with its many virtues. Most important, perhaps, is that it contributes to the atrophy of negotiation as a commonplace adult skill. Negotiation is a messy, uncertain business. When mutually independent peers must find a common way of proceeding, their different world views, personal styles, and vested interests render the outcome unpredictable. That is true whether the people in question are skilled workers and managers, shoppers and sellers, parents and children, members of congress, or independent nations. In the quest for a genuinely common good no one participant's version of the best solution can be adopted. Despite its inefficiencies, the interdependence inherent in negotiation requires—and therefore fosters—a capacity for intimacy with others not like myself and a constant alertness to agenda other than my own.

**After World War II**

The cultural dynamics of a standardized style have been at work in the body politic for well over a century. Nonetheless, their influence came to a sharp new focus in the wake of the second world war, and we cannot understand the character of the current symbolic crisis of United States technological style without paying attention to the extraordinary changes in national self-understanding that emerged from the war. The second world war was the only thoroughly popular war in United States history. Most Americans followed the war with passionate interest, know-
Recommended Reading


ing as they did friends or kin who risked their lives in places throughout the world, from Britain to Burma, North Africa to Guadalcanal. Concern for them forced national attention past continental boundaries. We began—it was a revolution for both America—on simply to look back to the homelands of our immigrant ancestors, but to look out at the wide world. Our consciousness was changing and, distracted by the pressures of a terrible war, we hardly noticed.

The war’s end sowed the seeds of technological ambivalence by revealing technical excellence as a form of the demonic. Germany, heretofore a world leader in engineering and science, shocked the world with its death camps. They were technologically elegant; one cannot exterminate millions of people without sophisticated systems. But the death camps pale in comparison with the extraordinary technical achievement of atomic bomb project. Images of these two technologies remain with us, compelling signs of an ambivalent era.

The first world war has been called “the chemists’ war.” In the second war, aircraft and electronics designers dominated the technical arena. Since the war, world communications networks (air travel, telephone, radio-television-satellite, and computer) have created economic and political world order woven together in a web of mutual causalities. Two hundred years ago we might hear of famine in Africa and grieve while realizing that we had nothing to do with the tragedy. Today’s troubles, in Ethiopia or Guatemala, press upon us partly because, in an era of multinational corporations, jet transport, and nearly instantaneously communication, our economy and polity directly affect theirs. But even if we wanted to ignore those links, the radio-television network forces us to pay attention. Each day, news programs broadcast a bewildering array of foreign events into the privacy of our homes. Increasing international awareness of natural resource limits—water shortages, deforestation, toxic pollution—begins to make us see systemic technological expansion as an ecological problem of planetary rather than local or even national dimensions.

Finally, Americans have recently begun to realize that we may no longer be “number one,” at least not economically. We find this particularly unsettling because America had emerged from the second world war as the undisputed world power on all counts. The atomic bomb, together with our sophisticated long-range bomber fleet and electronic information network, gave us trump cards to play as we confronted the new Soviet adversary and ours was the only industrial plant left standing after war’s ravages. We saw ourselves as the planet’s benefactors as well. At great national sacrifice, we had defeated two enemies whom we saw to be demonically and, in the process, saved the world for democracy. A return to domestic abundance enhanced the heady excitement of war’s end. After fifteen years of enforced abstinence (the Depression and the War) Americans could again buy new homes, automobiles, and household appliances. Consumerist hunger for these goods fostered an economic boom of unparalleled proportions.

Gradually, however, circumstances have changed. Russia, driven to suicidal economic competition with the United States, has collapsed, leaving a massive and volatile political and military arena. The United States, for its part, displays the economic and technical erosions of the five-decade-long arms race in a national economy burdened by debt and tax resistance on every level. New industrial centers, Japan and Germany being only the most noteworthy, have rebuilt from the war’s ruins to challenge our technological supremacy. Tribal and ethnic hatreds, long suppressed in the name of a two-power global competition, have burst into flame in so many places that it is hard to keep track of them all.

The cumulative effect of these events is unsettling, revealing as it does a nation in crisis and a troubled world suddenly grown very small. Throughout our history and almost without our noticing it, America’s technological success depended on the nation’s splendid isolation. Our technological style emerged in a massive land so extraordinarily endowed with natural resources and so empty of any history deemed worthy of notice that we assumed
unlimited expansion as a national birthright. But the very expansion of those systems that now unite the planet, together with our technological style's neglect of the habits of negotiation, have caught up with us. Americans must learn to negotiate with one another, with the natural environment, and with our planetary neighbors. We cannot foresee the outcome and that frightens us.

As evidence of radical changes in the world's ideological, military, political, and economic arrangements mounted during the 1980s, the nation's love affair with big-system technological optimism took another turn. The myth of the endless American boom, coupled with the earlier myth of technology conquering nature and American exceptionalism, generated a perfectly understandable flinch mechanism, turning up the heat under the progress myth with more and more frantic manipulation of symbols to move more and more incredible products. How much difference do we find, for example, between selling perfume and selling the Iraq war, or selling a congressional candidate? What are we to make of the recent hype surrounding Windows 95, an operating system too clumsy and memory-hungry to live up to its press releases? Currently, Congress is debating welfare reform, with some calling for dismantling welfare altogether, insisting that all "get jobs." This while managerial strategies and technological investments increasingly require a small number of very highly skilled workers, leaving a massive "underclass" who have little possibility of finding jobs with pay that can support adult life. Ultimately, the symbols of technological triumph may have become as confused and confusing as they are because of a collective loss of nerve. It may be that, while we citizens of the late-twentieth century recognize the need to renegotiate the ways in which we allocate resources to solve our problems and serve our dreams, we fear that we have not the courage and patience and humor and passion by which a people forges its civic order anew.

we fall heir at the end of this century of standardized systems? What, in turn, would happen if we were to teach our professional courses—engineering and business and law and architecture and medicine—with an increasing recognition that professional elites cannot practice today if they will not connect their mastery of disciplinary expertise with an equally adult commitment to grow more subtle and engaged with the larger issues of the public order? Public adulthood, the virtue of citizenship in the larger world, requires a commitment to pay attention, to contemplate human decisions with a willingness to be implicated in their results. That takes great courage, because we must contemplate before we know what to do about what we will see. Contemplation liberates the imagination. The daring risk of looking and listening flows over into imagining how we might act in response to what we find. We underestimate, I suspect, the bravery that is required to read the newspapers, to look out the window and probe the implications of the structures and decision-making processes we find in our societal world. Could we all learn—we teachers and staff and administrators and students—to imagine ourselves as members of a community of encouragement? En-courage: to stir up and to evoke courage within one another. We need to listen to the reports that each of us brings back from our contemplation of the world we live in. We need to take seriously the soft-spoken despair that whispers to us that our imaginations have died and our capacity to make adult decisions about our public order has withered:

I know the plans I have for you, says the Lord, plans of fullness, not of harm. To give you a future and a hope.

Jeremiah wrote his prophecy, we might remember, in the face of societal decay as violent foreign armies massed to destroy his homeland. When we risk contemplation of our own time we find companions from every age of the human story.

### Conclusion: Teaching Students to Read the Signs

My interpretation suggests that the students we teach now have inherited a profound ambivalence about the claims and denigrations of technological progress. If that is true, what does it imply about the way we teach (or should teach) them? Let me suggest one way to think about the matter. We might respond by emphasizing even more than our schools have throughout the twentieth century the centrality of what Ignatius and his followers called "discreta caritas," a far-reaching love for the world that is tempered by discernment. In the language of this article, we could call it the habit of imagining ourselves as decisive adults in the public order. Perhaps we could make a distinctive contribution to today's pervasive talk about educating for critical thinking by connecting critical thinking with an active engagement in the world's unfinished decision-making processes? What would happen if we taught the humanities, with their central commitment to the nobility of the human condition, as oriented toward an understanding of the world precisely those ambivalences and evasions to which