September 1982

Fables for the Information Age: The Fisherman's Wishes

Carolyn Marvin
University of Pennsylvania, cmarvin@asc.upenn.edu

Fables for the Information Age: The Fisherman's Wishes

Abstract

The computer revolution is less a revolution in the usual sense of the word than the announcement of a glamorous marriage between two powerful promises in the history of the modern West, the Enlightenment, the impulse to encompass the entire world in a rational system of knowledge, and the Industrial Revolution, the fruit of an ancient impulse to reduce the demands of nature to insignificance. By now we know that some of the fondest legacies of the Enlightenment, such as the belief that the world is fully knowable and that nothing more than rational knowledge is necessary to make us free, are ambiguous ones, but it is still difficult for us to admit that the vision of the Industrial Revolution was naive. In many ways we still believe that utopia is available to everyone who has the right equipment.

Fables for the Information Age:

The Fisherman's Wishes

By CAROLYN MARVIN

Photo By Robert Hanke

This second series of humanities essays is made possible in part by a grant from the Illinois Humanities Council, in cooperation with the National Endowment for the Humanities.

IHC ILLINOIS HUMANITIES COUNCIL

This is the fourth of five original essays by distinguished humanists to be published in *Illinois Issues* in 1982. No restrictions in regard to style, form or perspective have been placed on the authors. They have been encouraged to use any one of a number of approaches including exposition, analysis, satire and parody.

Reprints of these essays are available at no cost from the Illinois Humanities Council, 201 W. Springfield, Champaign, Ill. 61820.

The computer revolution is less a revolution in the usual sense of the word than the announcement of a glamorous marriage between two powerful promises in the history of the modern West, the Enlightenment, the impulse to encompass the entire world in a rational system of knowledge, and the Industrial Revolution, the fruit of an ancient impulse to reduce the demands of nature to insignificance. By now we know that some of the fondest legacies of the Enlightenment, such as the belief that the world is fully knowable and that nothing more than rational knowledge is necessary to make us free, are ambiguous ones, but it is still difficult for us to admit that the vision of the Industrial Revolution was naive. In many ways we still believe that utopia is available to everyone who has the right equipment.

Older by far than these two projects to shape human existence is the quest of the humanities to understand the meaning of human dignity and identity. Their most distinguished efforts have come from the desire to open human imagination to its highest possibilities and greatest freedoms. The humanist examination of values at the core of human experience offers some of the most searching standards by which to measure the Midas-like claims of the information revolution.

The marvelous capacities of new information technologies are not in doubt. But virtuosity is not virtue. All technologies that promise to make recalcitrant social problems yield to apparatus are suspect. So advertised, they have the greatest power to enter and alter our lives in unanticipated ways. Without any doubt, new information technologies pose life-transforming questions of access and control, price and distribution, the changing organization of labor at home and abroad, altered structures of banking and finance, what information will be hardest to come by, what information will be most highly valued — and most important of all, who is to be put at risk by the changes taking place, and how.

But there are things we are entitled to expect from an information revolution worthy of its name. A revolution that deserves our sympathy usually involves a shift of power from those who have more than is just to those with less than is necessary, accompanied by an increase in the general happiness. But the happy people in the imagery of this revolution are already comfortable and affluent. They are frequently bosses, but there are grateful subordinates in evidence as well — clerical workers, salespersons, assembly line workers and children. This is a paradoxically orderly revolution, promising simultaneously to change everything and to support and maintain the order we know best. It is depicted always as a bloodless revolution in which no one will get hurt, and everyone will get more stuff.

The information revolution has other distinct public meanings as well. It is advertised as a crowning achievement of Yankee ingenuity applied to the enterprise of science. (Japanese successes are often interpreted as an example of the effective transfer of Western psychology.) Since large numbers are a well understood sign of power in our culture, impressive quantities are used to describe the recent growth of information products and processes. This year, for example, it is predicted that the number of computers will outnumber all the people on the planet. The number of people who effectively direct all those computers does not seem to concern us as much.

Another sense of the information revolution is economic. It is defined as a shift of capital and labor from extractive and manufacturing industries towards information products and services, with a corresponding shift in GNP. The dimensions of this shift are controversial, since our criteria for classifying and defining information products and services are evolving ones. Its significance is also debatable, since it is not clear whether this is a true shift in the motor of economic growth or the evasive action of an economy in trouble. And finally, the assumption that information has not always been a salient feature of economic activity is a modern conceit. Though economists do not yet have useful conceptual and mathematical tools for disaggregating it historically, information has always been a significant factor in economic activity. To conclude that information is economically emergent only in our own age is something like writing the history of newspapers by asking when they first began to resemble the *New York Times*.

Finally, there is a social sense of the information revolution, in which it is held that power is shifting to those who command new kinds of information. This is the most problematic claim of all, since there is no single social order emerging from the information revolution, but a series of competing orders filtered through ideal images for popular consumption. Three of the most viable orders are those of family, work and time.

The new information revolution creates a friendly consumption community populated by members of the nostalgically reconstituted family of the post-war suburbs

In the iconography of the information revolution, the family that buys a home computer (much as earlier families purchased the *World Book Encyclopedia*) plays the role of the nuclear family, a favorite national character. The family shattered by the generation gap, television, divorce, automobiles, fast food and property taxes, the family once organized around familiar arenas of consumption — a carport, a home, a yard with a barbecue pit — the family which is rarely ethnic or minority in custom or hue, has lately been reassembled around the home computer. The video game removed from the temptations of the video arcade to a

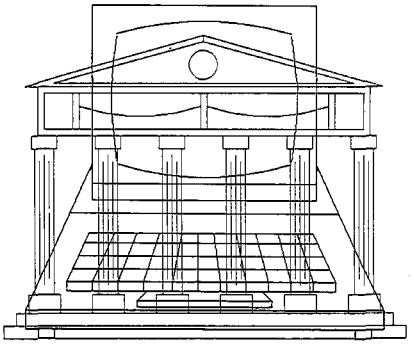
well-lighted domestic setting is the hearth around which the nuclear family blossoms into an extended family of little kids, big kids, parents, grandparents, uncles and aunts. The new information revolution creates a friendly consumption community populated by members of the nostalgically reconstituted family of the post-war suburbs.

A second narrative of order, this one of work, depicts an executive whose radiant smile tells us he is not afraid of the personal computer proudly displayed on his paperless desk. This executive may have to learn to type, but on the model of a pilot in control of a vast cockpit, not a secretary churning out endless assignments for others. ("Inside Every Investment Analyst Lives a Daring Sub Commander," declares a recent Radio Shack advertisement for personal computers.) The white-collar worker of popular convention rarely moves real burdens against gravity or through space. He or she manipulates the magic levers of thought and influence. But this executive surpasses all white-collar competition shackled to an earthbound realm of paper, which may not be heavy to push but must be physically sorted and tracked. With an infinite electronic reach at his fingertips and the timeliest information from the vastest data banks, he is lord of all his computer surveys. He represents the biggest target market for personal computing, the largest growth segment in the computer industry. His secretary, on the other hand, a clerical worker along with 20 percent of all American workers, may find her job phased out completely if he can be persuaded to compose text directly into a word processor instead of writing out his rough drafts by hand or dictating them.

The information revolution is also portrayed as the harbinger of an ideal future, or temporal order. History, the old order, is no longer something to enrich and teach us, but something to be sloughed off, a disorder that perfect technologies can repair. Computing will rob history of its power over us by halting the tragic consequences of accumulated past errors. If the perfect technology can be put to work in time, we will stop history in its tracks. Such beliefs rest on the conviction (a puzzling one, given the realities of everyday experience) that the Industrial Revolution severed the inexorable chain of fate, and that every subsequent technological development has been a further unraveling of historical necessity.

To the endless argument about whether technology enhances the social order, is at war with it, ought to replace it, or is simply its instrument, this ideal temporal order answers that social orders will come and go as long as we are ruled by history. Technology, in this view, is not a narrative of order, but a clear and distinct reality with the power to enter history from without. This argument is made on two contradictory grounds. If history is an adversarial contest with nature, then by embodying our creative ingenuity, technology has the power to temper nature and finally to conquer it. On the other hand, if history is mainly a narrative of man's inhumanity to man, then technology, which answers only to the impartial authority of nature, can transcend our quarrels and create a world of plenty in which all conflict, having no purpose, will vanish.

There is an unworkable paradox in the presentation of technology both as constrained by natural law alone and entirely transparent to our wishes. Nor is technology an autonomous agent of change, as some current philosophical fashions have it. It is never apart from our history and our values, the things that define us as social beings. Like all human creations, it is an expression of social order and interest, inextricably bound to circumstance and history. Since order, interest, circumstance, and history are also grounded in the natural universe, technology participates in both the world of imagination and the world of nature. It is above all a special kind of power to make the world of dreams real. Technologies are embodied hopes, devices to implement beliefs about how the world could be made different. Technologies are social dreams and fairy tales in action.



Our public fairy tales about computers are plentiful but shallow, perhaps because they are very new. They tell us the content of our wishes but do not present the framework of wish-making and the problems it presents. The vivid plumage of current forms nevertheless brings to mind one of the most instructive of traditional fairy tales, the tale of three wishes. In return for giving aid to a stranger who turns out to be an unrecognized divinity or, alternatively, some concealed potential in ourselves, an ordinary human soul, sometimes a fisherman, receives a boon of three wishes. The consequences of the wishes always surprise the wisher and always outstrip his efforts to negotiate an advantageous bargain with destiny. Outdone as often by his ignorance as by vanity and greed, he often must use his final wish to undo the unforeseen consequences of earlier ones.

One of the lessons of this tale is that we can bargain with fewer aspects of destiny than we think. We are never completely in control of the future. We never truly recognize the stranger in front of us, and our best impulses may precipitate great tragedies. Like the fisherman's imagination, our imagination is always limited, never omniscient. But technology, our wish come true, is not limited in its effects by our imagination. It is not only technology, among our creations, that has this peculiar relationship to its creators. Likewise our language, our art and our children, carefully nurtured projections of our imagination all, also are not fully under our control, which fact is a source of constant wonder as well

as chagrin. In many of our most hopeful expectations for the information revolution are fishermen's wishes of this kind, fantasy solutions to difficult problems incompletely considered.

Let us look at three of the most widely held expectations for the computer revolution:

1. The desire for options, for choices, for self-determination and deliverance from coercion, the wish for freedom to choose our own destinies, is represented in the notion that computing technology, like every other technology, is neutral. It can only hurt us if we look it in the eye and give it our permission to do so. It can be put, with the same facility, to entirely constructive uses.

2. The desire for well-being, for the guarantee of a safe and secure framework within which to pursue the life we cherish, is represented in the notion that computers and computing skills will diffuse automatically and democratically. The natural seductiveness of computing in combination with the free market will nourish political and economic democracy.

3. Finally, the wish for pleasure, for what gives us human delight, is represented in the notion that computers offer novel possibilities for self-expression and development; in particular, that the vastly expanded storage capacities of computers offer inexhaustible resources for liberating the human spirit.

Technological neutrality

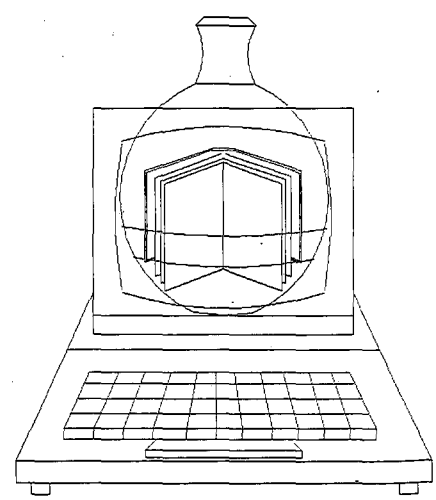
Perhaps the most optimistic of these is the wish that technology should be neutral, that it should not take sides in the human enterprise to the advantage of some and not others, or worse, take sides against humanity collectively. Since technology may be used for good or evil, and since it has been used for both, the neutralists believe their case is proved. In the information revolution we are continuously verging on, a state which defers all consequential decisions to the future and makes no one responsible for anything so far, the choice seems to be entirely ours to restrict ourselves to good intentions while avoiding serious mistakes. The major flaw in this argument is not the assumption that human nature is reliably benevolent, but the assumption that there is a breathing period in which technology exists pure and untouched *before* human beings decide to use it for good or evil. There is also the assumption, already noted, that the deleterious effects of any technology can be foreseen and controlled, chosen or rejected at will.

Technology is the imposition of an order on nature by human beings for the sake of some imagined useful purpose. Even if technology cannot actually violate nature's order (at least not permanently), its human design is a set of choices, at every level an expression of value. All technology is human-made. If it's not human-made, it's not technology; it's nature. Nor is nature neutral to the human beings who live in it. It is beautiful, awesome, soothing, difficult, helpful, dangerous by turns, but it is never value free from the only perspective available to us, our own. A modern adversarial view of nature is responsible for the kinds of technology we have created to distance ourselves from it. This nonneutral view of nature as a foe to be manipulated, rather than a powerful partner with whom to live in cooperation, has been responsible for a scale and quality of technological development about which serious questions must be raised.

Every investment of social resources in a particular technological order changes the possibilities for realizing alternative social and technological orders. This can be said more bluntly. Every attempt to serve the interests of one group of people within the sheltering framework of a particular technological arrangement limits and sometimes excludes possibilities for serving the interests of other people, or for serving different interests of the same people. This selection process has specific consequences for real human beings whose future choices (and whose children's choices) will be constrained by decisions made with or without full appreciation of the chain of effects that will follow from them.

Some proponents of the neutrality argument claim, for example, that even the bomb, that ominous symbol of our age, is "neutral." Not until the button is pushed will the bomb have consequences that are, in the tradition of the three wishes, truly unimaginable. But the logic of consequence cannot be suspended until this final terrible moment. The consequences of the bomb are not simply a latent potential as energy is latent in a stone. Every decision to research, develop, produce and maintain bombs requires accompanying decisions not to do other things. The very lowest level commitment of material to bomb building, instead of, say, to the manufacture of efficient cooking and heating stoves contributes to a particular configuration of society and of the world itself. These are morally complex and intricate configurations, but they are not morally neutral and do not randomly cancel one another out.

A student with whom I was discussing this point once asked whether there couldn't be *some* perfectly neutral example of technology — whether, for example, a hammer locked away in a drawer and used by no one couldn't be considered neutral. I don't think so. A hammer represents a particular commitment of natural and social resources to its production and distribution among those who are thought to be entitled to it. Hammers locked in drawers also imply houses, which imply additional orders of social wealth



Technology is the imposition of an order on nature by human beings for the sake of some imagined useful purpose

and organization, relationships of people to nature itself, and so forth. They imply, further, a society whose members are able to buy tools which they do not earn their living wielding, who buy many things they do not need every day. All these facts have a vast and specific social significance which can be explored only with reference to concrete human lives and situations, but which cannot be insignificant or neutral. If a hammer is not as emotionally compelling as a bomb, it is no less embedded in and reflective of the society that makes it, even as it lies inert in a drawer much as a bomb lies in a silo.

In discussions of computers, the wish for technological neutrality appears in the commandment against anthropomorphizing them. Since computers are machines with no conscious intentions of any kind towards human beings in the way that we understand the term "conscious," the habit of treating them as though there were little men or women inside them responsible for the frustrations or rewards they bring us is regarded as evidence of fuzzy thinking and inappropriate psychological projection. To harbor such attitudes in a technological age is to be embarrassingly ignorant of the score.

It is true enough that a computer is not a person. But the plain facts are that there *is* a little man sitting inside, usually several little men, and more little women all the time. The myth of neutrality prevents us from understanding our experience of technology in precisely human terms. In point of fact, most of us will never transact directly with computing machines, whether those machines are "user-friendly" minicomputers or number-crunching mainframes. Only a few highly trained engineers and computer system architects will ever concern themselves with the computer as brute assemblage of chips and circuits. The rest of us must approach the computer as a logic system with many levels and rules for creating, manipulating and extending meaning. For most users, successful computing is mastering some range of programs and programming languages which are imaginative structures *created by other human beings*.

What it means to say that every computer contains a homunculus is that every computer program, system or language represents other human beings with whom we are directly or indirectly engaged in symbolic transactions of mutual responsbility. In the end, a computer program is nothing more than a new-fangled, highly mediated conversation among people in which each participant has his or her own part to play. If there is any error of mystification, it is in imagining that ordinary people are not entitled to raise questions about computer operation and accountability, since computers are merely machines. When the computer goes down at the bank, and you are left standing in line with the excuse that "the computer . . ." followed by various disclaimers of involvement on the part of bank personnel, the neutrality myth has been hoisted. A program shot through with errors and inflexibility, a program that does not take account of real situations in which real people will use it (the program at the bank that does not anticipate peak demand loads, for example), is a human creation and a human responsibility, as is the program that helps you do what you want quickly and efficiently.

The commandment not to anthropomorphize computers, to respect their mythical neutrality, transfers responsibility from those who construct poor programs and systems to nonexpert users who are encouraged to blame their own ignorance and anxiety for any unfortunate machine-man encounters, since the least knowledgeable and experienced users are most easily intimidated into believing they are not smart or quick enough to play in the front yard of technological culture. Those who are the most sophisticated in the use of this symbol system have the greatest responsibility to develop and share its potential benefits in a way that includes as many people as possible.

Safety and security

The same technology that is defended on some occasions as unimpeachably neutral is trotted out on others as the future foundation and chief guarantor of a Way of Life. We believe not only that utopia is available to everyone with the right equipment, but also that the information-age descendants of the Industrial Revolution will salvage the disappointed goals of the Enlightenment. The second fisherman's wish is the hope that computing technology contains, by nature, a democratic logic of development. Once (according to the rhetoric of the information revolution) computer hardware has diffused rapidly, widely and cheaply, then as effect follows cause in a fortunate chain of necessary events, the acquisition of computer skills by the population at large will follow painlessly. Since those who can most successfully manipulate the symbol systems of their age are best fitted to govern themselves reflectively and self-critically, widespread computer literacy will strengthen and enlarge the democratic character of daily experience. The present order will prevail.

Although computers are flexible enough to employ any symbol system programmed into them, including Egyptian hieroglyphics, alphanumeric symbols are the basis of common discourse among most computer users, and alphanumeric literacy is therefore the single essential prerequisite for computing skill. It is both a curious and true fact that alphanumeric literacy has never in all of history spread to any large group of people automatical-

ly. The effective diffusion of written literacy to new groups of any size has always required a very large effort by some authority with both extensive resources and large powers of compulsion — the state or the church.

In England, for example, the introduction of writing as a routine administrative instrument of government took two entire centuries, from the 11th to the 13th. Because of a series of state initiatives that made written instruments mandatory for all legal property claims in place of customary, age-old oral instruments, literacy was gradually extended from the king's court down to the level of municipal authority. But from the 13th until practically the 19th century, further increases in literacy were relatively modest, and most citizens remained nonliterate despite the invention in the 15th century of a new and powerful information technology, the printing press. Not until the advent of 19th-century compulsory education, representing state leverage on a grand scale, did mass alphanumeric literacy become a reality.

Even in the 20th century, mass literacy is pursued rather than achieved. Several years ago a University of Texas study suggested that perhaps 20 percent of American adults are not functionally literate. If we cannot create mass literacy by seduction in a world where the value and purpose of books are well understood, a world where literacy skills are familiar social furniture, the belief that the natural fascination of computing will be an adequate social stimulus to mass computer literacy is fantasy.

The diffusion of computers and computing skills depends on something besides desire, something that is neither democratically or automatically distributed — and that is money. A quarter will buy a video game, but video skills are not the basis of powerful computer skills any more than potato chips are the basis of good nutrition. Put another way, video games are to computer literacy as being able to sign "X" in lieu of one's signature is to the power of real alphanumeric literacy. There is a distinct class bias associated with the levels of computing to which people are likely to have access. Access to the most powerful computers is available to Big Business, Big Government and Big Education. Access to computers for job-related tasks executed by limited programs with little intellectual flexibility or power are available to a wide range of workers from airline reservationists to inventory control clerks. Video games are available to poor people. Which child, the child of the janitor or the child of the faculty member, will be more likely to acquire access to the computer of the university for which both their parents work?

Personal computers are certainly less expensive than large mainframes or sophisticated microprocessors, but are hardly within everyone's price range. The newest model Apple II personal computer fitted out with a modest but functional amount of software comes for around $1,500 and is not within the reach of poor families and many not-so-poor families in this country, though a national newsmagazine recently spoke reassuringly of new generations of home computers priced at under $1,000, "bringing them within reach of schools, parents, or the children themselves" ("Here Come the Microkids," *Time*, May 3, 1982, p. 51). This estimation of a ceiling of accessibility suggests a notion of the resources and opportunities of most children that makes the breath come hard. This is not democracy. This is a way to widen information gaps and keep people out of the information chain. The same economic and historical factors that make some persons more likely to receive excellent training in alphanumeric literacy, and others less likely to, are exaggerated when it comes to computer literacy. Skilled teachers of computer literacy are far rarer than skilled teachers of print literacy, and computer systems of any power cost far more than books full of powerful ideas. The largest national manufacturer of personal computers, Apple Inc., recently announced its intention to donate a tax-deductible minicomputer to every school in the United States. While the spirit of this plan may be laudable, logistically speaking, it is only somewhat more visionary than giving every school a single pencil for teaching written literacy.

A quarter will buy a video game, but video skills are not the basis of powerful computer skills any more than potato chips are the basis of good nutrition

The consequences of electronically created information gaps and monopolies are more serious still when we extend our concern to a world community. If it will be difficult to propel many of our own citizens into the computing mainstream, what can we say for the information age prospects of poor countries with large nonliterate populations? The computer information and communications networks which successfully serve industrialized economies pose terrifically difficult obstacles for countries already struggling to live with our technological precociousness. Nations knit by traditional oral systems of communication seem backward only in a world that measures power by the speed with which information moves and the extent of its reach. The political, economic and social disequilibrium in which these countries are placed by their simultaneous desires to compete with high-technology societies and to serve the basic needs of their populations is nevertheless real. Since the introduction of most technology is lumpy, it could be argued that eventually this balance will be redressed. What history suggests is that the balance will not be redressed automatically, as our fisherman's wish has it, and that for some groups redress will come too late or not at all.

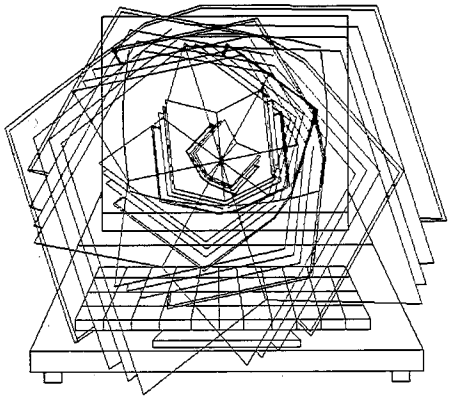
For it remains to be proved that technological advance raises everyone's standard of living sooner or

later. The social and economic cost to poor countries of Western technological development since the Industrial Revolution has never been seriously calculated. Over several centuries we have significantly raised the standard of living in the West, but the long-term effect on other parts of the world and our own future is not so clear. A number of cultures have been destroyed or irreparably damaged by our technological development. Others have shouldered massive economic dependencies.

Today, for example, large numbers of young Asian women work in high health-risk conditions at very low wages to assemble the integrated chips and circuits for which the West is so eager. For pocket change and the tinfoil excitement of a few years of urban living, some of them are jeopardizing their eyesight, and others are jeopardizing what social status they may have had in the traditional societies from which they come. They cannot easily return to the old society, where "factory girls" are often unmarriageable, their tenure in their present jobs is short, and their health may make them unemployable in other jobs. It is hard to believe that the diffusion of "progress" will compensate for the personal and cultural pain this work will mean for many of them. In this case, the burden of change falls heavily on the most defenseless.

The conventional belief that the invention of new modes and skills of communication is an unmixed blessing for the world finds little historical support. In this respect not even literacy has a thoroughly honorable history. In the half a millennium since the invention of printing, both printing and literacy have been used against cultures without these tools. With the indispensable assistance of maps and written orders, for example, large military and expeditionary forces were deployed from the Old World to the New by European invaders, and global trade was more easily organized to the strategic advantage of the West. Europeans denied Indian claims to their own native lands with the specious legal rationale (credible only perhaps to the *nouveaux literati* cultures of Western Europe) that the Indians lacked appropriate written proofs of ownership. On occasion Europeans, and later their American descendants, took steps to perpetuate the illiteracy of slave populations. New information technologies have always challenged old hierarchies of privileged and popular knowledge, but they have also introduced new and unequal hierarchies of privileged and popular knowledge as well.

One telling example comes from the history of telegraphy, the very first of the electric information technologies of which computing is the latest example. To many observers in the mid-19th century, the telegraph seemed quite as revolutionary as the computer seems to us. Jacksonian democrats of this period hailed it as a technology with a built-in logic decentralization and expected it to put an end to monopolies of information that distorted political and economic democracy. Information that could traverse continental distances instantly seemed less vulnerable to manipulation by the industrial East against the hinterlands.



Ironically, the telegraph for which so much had been hoped became something quite unexpected: the first nationwide industrial monopoly in the United States.

In a frequently repeated pattern, some early telegraph companies joined with regional railroad monopolies in arrangements that made them the exclusive carriers of all telegraph messages received and transmitted by the contracting railroads. In return, these railroads were accorded preferential telegraph rates and treatment. In the bitter competition of this period among scores of small telegraph companies, those with railroad alliances fared best and often merged into regional telegraph monopolies. Not long after the Civil War these regional systems had coalesced into virtually a single monopoly system of commercial telegraphy under Western Union. Before the end of the century most newswire traffic also belonged to a single company, the New York Associated Press, which also had exclusive Western Union contracts. The first electric information technology erected new forms of centralization and monopoly, and became a prototype for modern big business.

Computing for pleasure

The last of our fisherman's wishes is that computers should offer new opportunities for creative pleasure. Though we seem to wish for more play in our lives, play has no ritually honored or justified place in our society. It is what can begin only after all the work is done. And the work is never done. When new information technologies shorten the time or decrease the capacity needed to accomplish a given task, we increase the number of tasks for which we are responsible and extend the range of their operation, so that additional time and space that might have been given to playful expression is once again dedicated to productive necessity.

The more communications capacity we create, the more opportunity for purely imaginative communication there could be. The rhetoric of productivity that dominates our lives subordinates all play to the major task of managing the world's more and more tightly wound economic machinery, instead of as a social function of the greatest importance. Play explores what is unexpected and surprising. It lays the groundwork for noncoercive social and personal change. Certainly play has a ritualistic and socially conservative character as well. But genuine playfulness stretches imagination by

releasing it from bondage to one task. By encouraging the shock and delight of the unanticipated, it promotes transformation. Its dynamic agent is not social compulsion, but the fascination of previously undiscovered possibilities. Play is a genuinely constructive instrument of social change. The more constrained and specialized our social roles, the more important is the existence of a playful experimental margin within which more fragile and tentative aspects of personal and social development can flourish. Play can also offer us imaginative worlds to cultivate that do not require the production and consumption of more and more goods for their maintenance. In a world of dangerously diminishing resources, the cultivation of creative playfulness as an alternative to the insatiable overconsumption of so many industrialized societies may be crucial.

New technologies create conditions for new power struggles; they are the manifest imperfection as well as the marvel of our morality and imagination . . .

With the emergence of new information technologies of greatly increased capacity and interactivity, scarcities of the means and resources for communicating are sometimes described as a thing of the past. The notion that new technologies will absorb the overflow of utilitarian message-making and offer a wealth of extra channels for imaginative play and development is not a new one. All the civilizations to which writing and printing came learned to swallow the increased volume of messages those technologies made possible and to demand more. The scarcity of channels with which to communicate has always depended more on social, political and economic priorities, arrangements governed by human values all, than on simple technological virtuosity.

Technologies like computing do not, no matter how much we wish them to, release us from the eternal human obligation to make responsible value choices. Something more than apparatus will always be required to free us from the shortcomings of our own morality and imagination. New technologies create conditions for new power struggles, they *are* the manifest imperfection as well as the marvel of our morality and imagination, they use scarce resources which are then unavailable for other purposes. And this will always be so.

Many of the most disturbing consequences of the information revolution are taking place out of the spotlight where it is hard for us to see them, in the margins of our own and other societies, among the poor, among Third World populations, among women and the elderly, in the environment itself, among many groups whose connection to centers of power is very tenuous. Because it is always difficult to see effects at the margins, it is even more difficult to understand the connections from these effects to the choices for which we are answerable. Many people can be damaged before those with the power and the concern to change such conditions, certainly all of us with a generous share of the creature comforts of our age, take notice. Technology, information technology especially, should not give us the power not to notice that others are in trouble.

New information technologies will be used by the powerful to increase their power unless somebody makes other plans. And just as freedom, security and pleasure have never been easily won in the history of the world, just as that battle is never fully won and must be continually refought, so it is not going to be easy now. But it is going to be important.□

The author: Carolyn Marvin

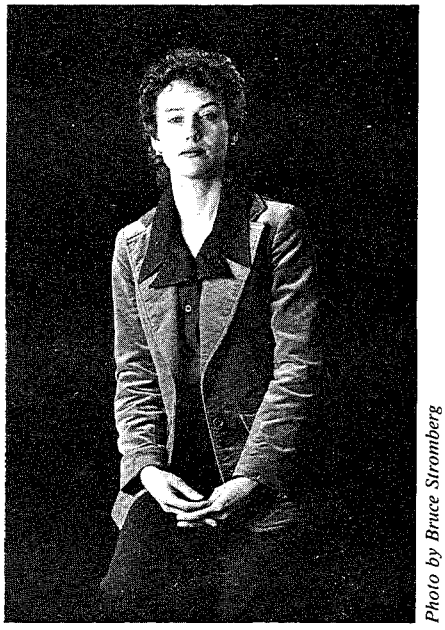


Photo by Bruce Stromberg

Carolyn Marvin is professor of communication at the Annenberg School of Communications at the University of Pennsylvania. She is currently writing a book about how people in the 19th century imagined the communications of the future.

Readings

□ Michael Clanchy, *From Memory to Written Record: England, 1066-1307* (Harvard, 1979).

□ Rachel Grossman, "Women's Place in the Integrated Circuit," *Changing Role of S. E. Asian Women: The Global Assembly Line and the Social Manipulation of Women on the Job*. Special joint issue of *Southeast Asia Chronicle* (no. 66, Jan.-Feb. 1979) and *Pacific Research* (vol. 9, no. 5-6, July-Oct. 1978), pp. 2-17.

□ Stanislaw Lem, "How the World Was Saved," in *The Cyberiad: Fables for the Cybernetic Age*, trans. by Michael Kandel (Avon, 1976), pp. 9-13.

□ Carolyn Merchant, *The Death of Nature: Women, Ecology, and the Scientific Revolution* (Harper & Row, 1980).

□ Robert L. Thompson, *Wiring a Continent* (Princeton, 1947).

□ Joseph Weizenbaum, *Computer Power and Human Reason: From Judgment to Calculation* (W. H. Freeman, 1976).