



**The John & Mary R. Markle Foundation** President's Essay



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## Habits of Mind and a New Technology of Freedom<sup>1</sup>

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Democracy, government by the people, rests on the fundamental idea that people as citizens, are able to act rationally in their own interests. This is most particularly true when citizens vote for their representatives. As James David Barber points out, however, the necessity for rationality in a democracy extends far beyond the voting booth to permeate a democratic society: "In practical terms, the requirements for rule by reason in a democracy are elections and parliamentary debate. But those requirements depend upon the workings of reason in the citizenry, which can be either developed or eroded by education, journalism, and entertainment."<sup>2</sup>

The habits of mind that we associate with reason and rational thought include study, analysis, reflection, contemplation, and deliberation. Yet, in our day-to-day life, these habits of mind receive little support or reinforcement. While the best teaching that occurs in our schools, colleges, and universities aims to produce these habits of mind, many critics fault much of the educational system for falling short of its goals. After formal education has ended, most people depend on the media for their information, education, and entertainment.

For the last 40 years, television has been the dominant communications medium. Newton Minow's words of 1961 are still apt: "I invite you to sit down in front of your television set. . . . I can assure you that you will observe a vast wasteland. . . . You will see a procession of game shows, violence, audience participation shows, formula comedies about totally unbelievable families, blood and thunder, mayhem, violence, sadism, murder, western badmen, western good men, private eyes, gangsters, more violence and cartoons. And, endlessly, commercials—many screaming, cajoling and offending. And most of all, boredom."<sup>3</sup> Implicit in Minow's criticism of the television industry is that, with rare exceptions, he found little to stimulate rational thought, study, analysis, contemplation, reflection, and deliberation.

In a recent book, Jeffrey Abramson analyzes the jury system as one of the fundamental structures of democracy in our society, and how changes in the jury system mirror other ongoing societal changes. Commenting upon the decline of deliberation, Abramson contends: "Deliberation is a lost virtue in modern democracies; only the jury still regularly calls upon ordinary citizens to engage each other in

**The electronic word is emerging as an important mode of social relations, as seen at New York's Cyber Cafe where conversations on the Internet supplement face-to-face interaction.**

a face-to-face process of debate. . . . Although the deliberative model of democracy survives in the jury, even there it is in serious decline.”<sup>4</sup>

Many students of democracy would echo Abramson’s comments as they examine the ability of citizens to act rationally in an increasingly complex and fast-paced world. All the habits of mind that are associated with reason seem to be in decline. Sometimes the blame is put on the educational system, and no doubt the critics of education have some merit in their arguments. Often, blame falls upon our political system with media and ad-driven campaigns, and the imperative of winning at all costs. Citizens themselves are blamed for their self-involvement and lack of concern for the polity. While these and other explanations may have some validity, I believe that we must also look to the nature and characteristics of our system of communications to find out what has been happening to us.

### **Technology and Habits of Mind**

There is a forceful interplay between society and its technologies. Society creates technology, but society is also created by technology. As Daniel Bell points out, Marx said in *Capital* that “in changing the technical world, Man changes his own nature.” If human nature is partially the result of a society’s technologies, it becomes crucial to examine technology both to ascertain the effects of technological

history and to attempt to infer the consequences of technological decisions on the future development of society.

There is no question but that the dominant communications technologies of the twentieth century have been the printing press, radio, television, and the telephone. All of us have been shaped by these technologies and by our use of them. One does not need fully to accept Marshall McLuhan’s aphorism that “the medium is the message” to agree that both technology and its content have human consequences. Books, newspapers, radio programs, and television shows differ among themselves, but all involve the transmission of information and knowledge from a central source to many people. It is these economies of scale that make them so cost effective. An hour of prime time television programming may cost more than \$1 million to produce, but when the cost is amortized over millions of people, the cost per person is minuscule. The rights to a book may cost millions of dollars, but the title can be sold for \$25 a copy. With a book, newspaper, television show, or radio program, we receive the communication via a one-way street. Although it may stimulate our thoughts, arouse our emotions, or cause us to act, we are described as “readers,” “listeners,” or “viewers.”

While reading, listening, and viewing all can involve thought and learning, because no conscious thought, response, or action may be

required, they can also be highly passive activities. All of us have had the experience of reading a page and not being able to remember what was being discussed, or even a single word. On one level, our eyes process the words, but our minds are elsewhere. The stereotypic “couch potato” sits gazing mindlessly at the television set, thinking hardly at all. Nevertheless, certain techniques can greatly increase the likelihood of thought.

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For example, questions can be introduced with the audience or reader invited to think of answers; anomalies can be created that invite resolution; moral dilemmas can be introduced with no immediate solution. These devices, however, depart from the normal conventions of the media. The absence of thought may be due to the lack of thought-provoking content, or possibly to hypnotic involvement with no time taken for reflection. Whatever the cause, I think it can be fairly argued that the technologies of broadcast communications and the printing press, on balance, favor the passive reception of information and entertainment.

I am not arguing against the value of reading, listening, and viewing.

They are vital skills—skills that can open the doors of culture and education. It is rather that the technologies with which these skills are usually associated favor passive reception over active thought. Among the skills of information reception, reading has a special place. The proficient reader has access to knowledge that is denied to the less-skilled reader. The written word remains the storehouse of the world’s wisdom and knowledge. Therefore, a special problem with television is that it has tended to displace reading in many young people’s lives. If there were no difference in content between books and television, that displacement in itself might not be very important. The problem is that reading opens the door to symbolic thought, and without that skill the citizen is severely handicapped. The corollary skill of writing also has special cultural value: A means of ordering and communicating thought, the discipline of writing is a powerful antidote to sloppy thinking.

There are certainly many exceptions to my generalization that, on balance, the technologies of broadcast communications, including the printing press, favor the passive reception of information and entertainment. Many books stimulate thought and even demand it; yet many others simply provide escape and diversion. Newspapers can similarly stimulate thought, but often only provide diversion. In his classic study “What ‘Missing the Newspaper’ Means,”<sup>6</sup> Bernard Berelson acknowledged the

“rational” uses of the newspaper in providing news and information. At the same time, he noted that reading the newspaper often becomes a ceremonial, ritualistic or nearly compulsive act for many people. Individual television and radio programs, such as Bill Moyers’s *Journal*, *Nightline*, Fred Friendly’s *Media and Society*, and others, may cause people to think, but few

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people would argue with Newton Minow that these are exceptions and not the rule. Finally, it is significant that we are called the “information society”—not the *thinking* society, not the *deliberative* society, not the *society of reason and rationality*.

The telephone is different. It is primarily a technology for conversation. Except when listening to a recorded message, people most often use the telephone to talk with each other. In this sense, the technology of the telephone favors active participation rather than the passive reception of information and entertainment. The limitation of the telephone in stimulating thought and deliberation, however, is that there is pressure for immediate response. In a telephone conversation, you seldom hear someone say, “Give me a few minutes to think about that.” They may say, “I’ll

call back soon with some thoughts,” but during the conversation itself, silence is likely to provoke the question, “What are you doing?” Perhaps people using the telephone are conscious that time is money, that when they use the telephone their bill is increasing; or in the absence of visual cues about the other person’s feelings, people may simply feel uncomfortable with telephone silence. Whatever the reason, the technology of the telephone, while involving activity, favors immediacy of response over deliberative thought.

This need for time for deliberative thought was brought home to me on a visit to Japan. In the early 1970’s, several of us went to Japan to discuss the production of a Japanese version of *Sesame Street*. With two colleagues from the United States, we met with the management of a Japanese television network. None of the Americans spoke a word of Japanese so naturally we had translators at the meeting. We would discuss an issue in English, and our comments would be translated into Japanese. Our Japanese counterparts would reply in Japanese which would be translated into English. Only after the meeting ended did we discover that all the Japanese present spoke perfectly good English. Whatever else the translation accomplished, it provided time for the Japanese to think over their comments before making them. They had time to think and deliberate—a distinct advantage in negotiation!

## A Benevolent Tyranny

The communications technologies that have permeated our lives—the printing press, radio, television, and the telephone—have brought enormous benefits. They have made information and entertainment available to the masses at a very low cost per person. The telephone has made conversation at a distance commonplace, and the costs of those conversations are steadily decreasing. Being able to talk from New York to California for 10¢ a minute or less, would have been unimaginable 50 years ago. Yet with all their advantages, these technologies have also exercised a benevolent tyranny over us. They have favored passive reception of information and entertainment over thoughtful reaction, and the telephone has favored immediate response over considered and deliberative response.

What I am describing as a “benevolent tyranny” would be judged more harshly by others. Many observers of our political system decry its dependence on television advertising and the techniques of mass marketing. The presidential debates, arguably the only political events that are somewhat designed to stimulate thought, have not yet been institutionalized. In the 1992 campaign, it is notable that Ross Perot’s “Infomercials” drew large audiences. Designed in part as teaching vehicles, they were very different from the normal campaign advertisements. Other critics are very concerned about a concentration of

media ownership which may consequently narrow the range of ideas to which the public is exposed.

I believe that we are fortunate indeed that the tyranny has been benevolent and that, despite the decline of the habits of mind that are associated with reason and rationality, we have remained a constitutional democracy. Although demagogues such as Father Coughlin and Joseph McCarthy saw the potential for power and tyranny in our mass communications, they were not in a position to dominate our institutions. Conditions were very different in Nazi Germany: Adolph Hitler and Joseph Goebbels saw that rationality was the enemy of National Socialism and dictatorship, and that modern mass communications (radio and newspapers) offered unlimited power to displace reason through the use of propaganda. In Hitler’s view: “What luck for governments that people don’t think. Thinking may be done only when an order is given or executed. If this is different, human society could not exist.” Goebbels, who carried out a program of propaganda and the displacement of reason, would “see that the press be so artfully organized that it is so to speak like a piano in the hands of the government, on which the government can play.”<sup>8</sup>

As human beings, we are extremely adaptable to the conditions in which we find ourselves. For those who live at sea level, the sudden transition to life in the mountains at 8,000 feet usually brings some

discomfort, shortness of breath, and perhaps a headache. But for almost everyone except those with respiratory incapacity, adaptation is complete within a few weeks in the mountains. Life on a farm with relatively few

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human contacts, living in harmony with the rhythms of the days and seasons, seems normal to the farmer. Yet most people who grow up on farms are able to adapt to the frenetic life of the city. And so we have adapted to the benevolent tyranny of our communications technology. Apart from a few holdouts, we have eagerly become compulsive consumers of information, viewers of television, and radio listeners. The decline of study, analysis, reflection, contemplation, and deliberation—the mental habits of reason and rationality—has largely gone unnoticed. We have adapted to the conditions that we and our technologies have created.

### **New Technology, New Freedom**

In the mid-1990's, the great story of communications technology is the growth of computer communications. Headlines announce the emergence of on-line services, the spread of the Internet, and corporate changes and acquisitions that involve these services.

Underneath these headlines there is another, and perhaps more important, story. While each commercial service tries to distinguish itself from the others by developing proprietary content, the most widespread use of on-line services including the Internet is electronic mail, or "E-mail." Just as the printing press, then radio, and finally television were technologies of freedom in their times, computer communications and E-mail can be a technology of freedom now.

For the purposes of this discussion, E-mail is the asynchronous electronic interchange of information between persons, groups of persons, or functional units of an organization together with mechanisms that provide support for the creation, distribution, consumption, processing, and storage of this information.<sup>9</sup> In more popular language, E-mail is the sending and receiving of information over computer networks and commonly involves sending a message from one person to another, or from one person to many, and includes bulletin boards and live chat. A regular E-mail message is analogous to sending a letter except that you can specify a single recipient or send the message to a complete mailing list. Bulletin boards are structured somewhat differently on the various services, but they all involve the public posting of messages with any reader able to send a reply. Live chat usually occurs in "rooms" or "auditoriums" and involves many simultaneous conversations or, alternately, discussions moderated by a host.



As this is written, the three leaders in providing consumer on-line services are America Online, CompuServe, and Prodigy. The Microsoft Network has debuted, and shortly there will be a completely revised Delphi under the sponsorship of News Corp. Accessed through computer, modem, and telephone connection, all of these services provide their own content. At the same time, all of them feature interconnection to the Internet and use the Internet to send E-mail. While subscriptions to the commercial services are increasing rapidly, the growth of the Internet better illustrates the spread of the E-mail distribution system. A recent survey of Internet host computers, which form the basic building blocks of the system, showed that 6.6 million Internet hosts existed in 106 countries worldwide.<sup>10</sup> Based on the growth rate of the last three years, there will be 101 million computer hosts by the end of the decade. This growth in the Internet as a distribution system helps us understand the astounding increase in the volume of E-mail. In November 1992, approximately 279 million messages were sent over the Internet. In November 1994, the number was over 1 billion—a growth rate of more than 90 percent per year.

Remarkably, these figures considerably understate the use of E-mail because they do not include E-mail sent over private networks in a business or organization. A poll by Louis Harris and Associates found that 83 percent of federal workers use E-mail

as do 65 percent of state government employees. At the 2,000 largest U.S. companies, 60 percent of employees use E-mail. While some of this government and business traffic goes over the Internet, most of it is obviously intra-organizational. At the Markle Foundation, a small organization with 12 employees, we have had an E-mail facility for about a year. Already, despite frequent face-to-meetings,

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E-mail has largely replaced paper memos, telephone slips, and handwritten messages.

In France, Minitel was started primarily to serve the telephone system as an electronic telephone directory with electronic “yellow pages.” Because it was a system that allowed two-way messaging, it quickly became popular for other uses, especially games and sex. *The Economist* reports that this system, which was started 12 years ago, now supports 6.5 million terminals used by 14.4 million people, about one-third of France’s adult population.<sup>11</sup> Use of the system for games and sex has declined from 22 percent to 14 percent, and the French now use the system mainly for

such things as banking and information. Minitel currently offers 24,600 services provided by more than 10,000 companies.

How can we explain the rapid adoption of E-mail? First, of course, in order to use E-mail you must both have a computer and be connected to a network. In 1993, 27 percent of American households had computers, and 11 percent of individuals reported using network services.<sup>12</sup> Network access doubled in the four years from 1989 to 1993 and continues to expand rapidly. Recognizing the importance of network connections, manufacturers are now shipping new computers with integral modems that make network connection more convenient to use than those purchased separately. One underlying answer to the question about the growth in volume of E-mail is clear: computer usage and network access are growing rapidly.

Once the equipment for E-mail—a computer and network access—is available, the cost of usage is vanishingly small. This is surely another important reason for its popularity. The vast bulk of E-mail goes over the Internet directly or is routed over the Internet from a commercial provider. While there is an institutional cost for Internet connection, it is ordinarily part of an overall institutional budget or, in some cases, a research budget. Once the connection is available, the huge capacity of the Internet makes the additional cost of an E-mail transmission almost nothing—and it makes no difference in cost whether

the message goes from New York to Washington, D.C., or from New York to Prague. Some commercial services charge for E-mail usage: For example, CompuServe has in the past charged to receive E-mail messages above a generous threshold of usage. The trend, however, is for commercial services to include E-mail as part of basic service. For both the academic user of E-mail over the Internet and the home subscriber to America Online, Prodigy, CompuServe, or Delphi, E-mail seems free.

The speed and reliability of E-mail are additional attractions that help explain its growth. Whereas a letter mailed through the post office may take several days for delivery, unless the sender opts for the expense of overnight delivery, most E-mail is transmitted almost instantaneously. At times of extremely high volume, there may be delays in delivery, but delays of over an hour or two are rare. Many E-mail services inform the sender if the delivery is successful so that the sender can take remedial action if necessary. One handicap is that E-mail addresses must be completely accurate. With the postal system, an improperly addressed letter may still be delivered correctly because the local postal personnel make a good interpretation. Not so with E-mail. An incorrectly addressed message will either not be delivered or will go to the wrong place. Smart software may eventually mimic the forgiving character of the postal system, but for now, accuracy in addressing is mandatory.

Low cost, speed, and reliability may be enough to explain the popularity of E-mail with business, but these characteristics hardly explain the growing social use of E-mail. If you have some special interest or concern, you may wish to discuss your thoughts with a group of knowledgeable or like-minded people. For example, you may be concerned about Bosnia or have a special interest in nineteenth-century poetry. Unless you belong to a relevant club or study group, you will likely find considerable difficulty in identifying appropriate discussants. Not so with E-mail. A recent census suggested that there were more than 60,000 active bulletin boards on the Internet. This afternoon I found five that were concerned with Bosnia. You may well find one that exactly meets your interest. If not, you can start a bulletin board of your own and see who joins. For those with computers, E-mail is an extremely convenient way of identifying other people with similar interests and carrying on discussion and conversation. Many observers of the bulletin board phenomenon have noted the personal value that comes from finding that other people share your ideas and concerns. For many people, it is highly satisfying to find that they are not alone.

In a face-to-face conversation, we all observe many social conventions, often unconsciously. An older person speaks differently to a younger person than to someone of his or her own

age. Men typically speak differently to women than to other men, and so too with women. Differences in age, gender, ethnicity, color, and status all influence conversation. The telephone reduces the impact of some of these social conventions, but much of the time they remain. The use of E-mail can be quite different. Many participants in bulletin boards or chat rooms use "screen names," perhaps a set of initials or the name of a mythical or historical figure. The address associated with the name is the location of a computer, not necessarily associated

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with the geographical location of the person. So in the cyberspace of E-mail, you may find yourself conversing with Achilles or perhaps Cleopatra. Whether these characters are actually men or women is revealed only if they desire to shed their anonymity. The result is that most of the normal social barriers to communication are stripped away. A novice chess player can converse with a grand master with only her expertise, or lack of it, to give her away.

Friendships can spring up between people who would not be likely to converse in person. In fact, one repeated finding about computer communications is that it tends to reduce social

isolation. People are more easily able to establish relationships than they are in day-to-day contacts. These same characteristics also allow people to flaunt social conventions more easily and use profane, abusive, or inflammatory language. Commercial services often reserve the right to eliminate offensive language or cancel the membership of an offender.

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On the Internet, this problem may be more difficult, but conventions are developing that allow groups to censor unacceptable conduct.

The features of E-mail so far discussed—low cost, speed, reliability, convenience, and anonymity to the extent desired—go far to explain the rapid acceptance and growth in volume of E-mail. The argument of this essay, however, is that E-mail is potentially so important that society has a stake in making access to it universally available. In our current communications environment, computer-mediated communication through E-mail, bulletin boards, and live chat is a new technology of freedom. I consider it a technology of freedom because it will counterbalance our traditional one-way media and help release us from their benevolent tyranny. The widespread use of E-mail will promote deliberative response over immediate response,

and active thought over passive reception.

Thomas Jefferson was a champion of reason and rationality, but he also lived in a time when the communications system supported the habits of mind associated with reason and rationality. The printing press made books available as well as newspapers and, despite Jefferson's well-known ambivalence about newspapers, he was a strong exponent of a free press. Aside from printed matter, communications took place in face-to-face conversations or through the exchange of letters. As anyone who writes knows, the act of trying to put your thoughts on paper enforces a certain discipline: Time is given to the choice of words and phrases, and except under the duress of tight deadlines, the writer has the luxury of being able to examine what has been written to see if it really conveys his or her thoughts.

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Similarly, when you receive a letter, you may read it over several times to be sure that you understand what is being said. In Jefferson's time, the mails were slow and we may surmise that special care had to be taken to say what you meant. Weeks or months

might pass before you had a chance to correct a misunderstanding. The necessity of writing, and the slow mail system forced study, analysis, reflection, contemplation, and deliberation. The clarity and wisdom of the Constitution and Bill of Rights were undoubtedly the product of powerful minds and rich experience. Of course, the communications system of the time also favored the deliberations, both face-to-face discussions and in writing and letters, that made those documents possible.

### **The Requirements for Universal E-mail**

For an E-mail system to be effective, people must be able to send E-mail as well as receive it. This makes the basic underlying requirement a two-way communications link. At present, the most widely available links of this type are the telephone line and cable television service. It is possible that electric power lines could also be used as well as wireless communications, but those applications are either experimental or not yet widespread.

From the user's point of view, the other requirement is a device to send and receive E-mail over the communications link. Computers and modems accomplish this function, and as has been noted, their use is rapidly increasing. While one in four American households in 1993 had computers, far fewer had modems. With the considerable decrease in modem cost and the increasing number of new computers being shipped

with integral modems, we can expect the percentage of households with access to networked computer services to grow rapidly. As would be expected, however, the distribution of computers is very uneven across groups with different levels of income. In fact, 50 percent or more of upper-income households have access to computers while there is little or no household penetration at low-income levels. Since the computer is a relatively expensive household appliance, costing \$1,000 and up, this uneven distribution is to be expected. As costs come down and usage grows, however, there could be a pattern of penetration more closely approximating the 90 percent of

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households with access to telephones or televisions. At current growth rates, that may still take many years. If we regard E-mail not as simply another consumer good but as a necessity for democracy in populous and technologically advanced countries, wise social policy will try to find the means to more quickly make E-mail service universal.

Nicholas Negroponte suggests that utilitarian computers can now be produced and sold for as little as \$200.<sup>13</sup> At that cost, less than that of a color television set, most American

households could afford computers, and if they found enough value in the services offered, could be expected to buy them. Although it has not yet been carefully studied, there is reason to believe that many governmental, public, and private services could be delivered cost effectively over computer networks through E-mail. If so, there might not only be widespread demand for the services, but the providers might subsidize delivery. Even with low-cost home computers, of course, there would still be segments of the population that would not have access. In these cases, government could play an important role by making network access devices available in public spaces such as libraries and post offices.

The final financial element to be considered is the communications cost for using E-mail. As has been discussed, people who are now connected on the Internet or who have commercial on-line services already pay the communications costs either indirectly or as part of their service. A low interconnection cost as an addition to a telephone or cable bill could provide many Americans with the necessary communications links, although again that would not take care of low-income groups. At least two companies are already experimenting with "free" advertiser supported E-mail: Freemark Communications and a new venture called Juno have announced their entry into the advertiser-supported E-mail market. If these or other advertiser systems catch on, the communications costs

of E-mail will no longer be an issue of equity.

If universal E-mail is to be implemented, there are many other policy and technical concerns that need to be addressed: addressing (how to give everyone a unique E-mail address), privacy, authentication of documents, sorting of "junk mail" from mail you wish to read, and security. Most of these problems are already being studied in the Internet environment, and while some are difficult, there is little doubt that satisfactory solutions can be found.

A more potent objection to the proposal for universal E-mail is that in order to use it people will need to know how to read and, if they wish to send messages, type. In a few years, as voice recognition systems become more practical, this objection will not be as powerful. Nevertheless, it is hard to imagine that, for a long time, people who cannot read or type will not be disadvantaged in the E-mail world. My answer is that this is exactly one of the benefits of universal E-mail. It will give people a strong incentive to learn to read and type and, if they have access to computers, the means to teach themselves to do so. It is noteworthy that in May 1995 the fourth best seller in the list of Macintosh software titles was "Mavis Beacon Teaches Typing" at a cost of \$25.

The vision of a rational society, a society of reason, is an ideal that will never be fully realized. Yet, through the development and wise use of technology, we provide ourselves with better means of reaching that goal.

The printing press and broadcast technologies opened new vistas of learning and knowledge about the world around us. At the same time, they tipped the balance of our habits of mind away from analysis, study, contemplation, reflection, and deliberation. Now, a newer technology, computer communications and E-mail, may help right the imbalance created by the older technologies. It is a new technology of freedom. Potentially, E-mail allows individuals to be their own publishers and reach as many people as their creations merit. As a

form of two-way communications, E-mail favors active thought over passive reception. Because E-mail does not require immediate response, it can allow time for study, analysis, contemplation, and deliberation. And because E-mail involves reading and writing, it gives a strong incentive to acquire these vital cultural skills. The technologies of freedom will be greatly strengthened as computer communications and E-mail join the more established communications technologies and become universally available.

1. This title is borrowed, in part, from Ithiel de Sola Pool, *Technologies of Freedom* (Cambridge, MA: Harvard University Press, 1983).
2. James David Barber, *The Book of Democracy* (New York: Prentice Hall, 1995), 291.
3. Newton N. Minow, "The Vast Wasteland" (address presented to the National Association of Broadcasters, Washington, D.C., May 1961).
4. Jeffrey Abramson, *We, the Jury* (New York: Basic Books, 1994), 8.
5. Daniel Bell, "Social Science: An Imperfect Art," *The Tocqueville Review* 16, no. 1 (1995), 13.
6. Bernard Berelson, "What 'Missing the Newspaper' Means," in *Communications Research*, ed. P.F. Lazerfeld and F. Stanton (New York: Harper, 1948-49), 111-129.
7. Richard Abraham, *Alexander Kerensky: The First Love of the Revolution* (New York: Columbia University Press, 1987), 22, 25, quoted in Barber, *Book of Democracy*, 312.
8. Alexander F. Kerensky, *The Crucifixion of Liberty* (New York: John Day, 1934), 104, 119, quoted in Barber, *Book of Democracy*, 321.
9. This definition is drawn from a RAND study: Anderson, Shapiro, Bikson, and Kantar, "The Design of the MH Mail System" (N-3017-IRIS, RAND, December 1989).
10. This work was conducted by Mark Lottor of Network Wizards in Menlo Park, California, and John Quarterman of Texas Internet Consulting in Austin, Texas.
11. *The Economist* (August 19, 1995), 62.
12. I am indebted to a RAND study for much of the information that is cited in this essay: Anderson, Bikson, Law, and Mitchell, "Universal Access to E-mail: Feasibility and Societal Implications" (MR-650-MF, RAND, October 1995).
13. Nicolas Negroponte, "Affordable Computing," *WIRED Magazine* (July 1995), 192.

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