

they have a social duty, the subject might at least move higher up on their own agendas.

Broadcasters should pay for their franchises. Since the early days of radio, it has been periodically proposed that broadcast channels should be auctioned off to the highest bidder, with the proceeds going into the public treasury and some substantial percentage of the money allotted to strengthen public broadcasting. This reasonable idea has rarely been seriously discussed either in Congress or in the press. Affirming the principle that public goods should be paid for need not mean putting the present broadcasting system up for grabs, which would create chaos and be unacceptable to the public. However, in a time of transition like the present, it is important to have this principle in place.

Communications channels should be recognized as public utilities, and their ownership and control should be separated from control of programming. By strict logic, this rule would force newspaper owners to divest themselves of their printing plants and radio stations of their transmitting towers—not likely or politically feasible. However, the principle of separation can and should apply to all wire-transmitted programming and information—by cable, telephone or even over the electric power grid—and it should apply to microwave direct broadcasting by satellite as well. Why is such separation desirable? Because it would keep the powerful monopoly utility, the carrier, from also determining what ideas and images are fed into the cultural mainstream.

A modest fund should be created to stimulate research into aspects of mass communications technology that are not responsive to market forces. An example might be the development of new low-budget ways to distribute newspapers to match the much lower cost of producing them in the computer era. This would make it easier for new papers to start up in a time of constricted advertising revenues and would restore competitive energy to local journalism. Will the development of such technology emerge from the newspaper industry itself? Not likely from a business that has been investing 0.2 percent of its revenues in research and development and that lives comfortably with its local monopolies.

Funding for public broadcasting should be increased, and its governance system safeguarded to protect it from political interference. The nation's total investment in public broadcasting represents only 2 percent of the annual spending on television and cable. Britain spends thirty-six times as much per capita on public broadcasting; Japan seventeen times as much.

Most important, media policy should be seen as social policy, not just as the legal administration of technical complexities. Broadcasting frequencies must be allocated to avoid chaos on the airwaves, but the F.C.C.'s rulings have consequences for every aspect of national life. Educational policy is made by educators, not left to lawyers. Why should the F.C.C. be a lawyers' preserve? The public accepts enormous expenditures on schools as a necessary social obligation. Television is no less a formative influence than the classroom and deserves to be taken far more seriously as an educational resource. (In many school districts, it is just a commercial opportunity for Channel One, a venture of Time Warner affiliate Whittle Communications.)

Education is a matter of public concern, at both the community and national levels; but mass media policy has not been a matter of widespread interest. As it deals with ever more complex technical matters, it becomes increasingly inaccessible to general debate. Vigorous discussion, and not just by experts, is precisely what media policy needs as we enter an era of powerful new communications technology. □

■ THE INTERNET

The Whole World Is Talking

KEVIN COOKE AND DAN LEHRER

Halfway around the world, Wam Kat files daily reports on life in Zagreb, Croatia. "I just stood about half an hour in the supermarket downstairs watching a firmly built man. . . . He was shouting at everybody in the shop," he wrote on May 24. "From what I could understand, he said that when Croatia was under the Serbs (in former Yugoslavia), the price of bread was at least half of what it is now. Just a few days ago I heard somebody say that under the communists we had our problems, but now under the capitalists we have our problems too. What is the difference if you work for the communist or capitalist elite?"

Kat's bulletins, which he calls "Zagreb Diary," don't appear in Yugoslav papers or on television. They exist in cyberspace. Kat types them on his own computer in Zagreb and sends them by modem to an electronic bulletin board in Germany. From there, his stories are relayed to computers around the world via the global mega-information stream called the Internet.

"Electronic mail is the only link between me and the outside world," says Kat, writing by e-mail. The Croatian government owns all the major media in the country and is prosecuting a group of journalists for treason.

Kat is only one of the millions of people participating in this community without walls. During other recent cataclysms, the Internet provided an instant, unfiltered link to the world.

"In Russia, during the coup attempt, people were providing live reports on Russian Internet about what was really going on. They were widely circulated on the Net," says Mitchell Kapor, founder of Lotus Development Corporation and now chairman of the Electronic Frontier Foundation, a group advocating "electronic civil liberties," primarily freedom of speech and privacy. "During Tiananmen Square, students were getting the news out and were fundraising through Internet," adds Tom Mandel, a futurist with SRI International, a Silicon Valley-based consulting firm. "There were a bunch

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of us hungrily reading newsgroups, stuff we weren't getting from reporters." (Newsgroups are open discussion groups where people can post their views.)

But the Net is changing more than just the flow of information; it's changing the way we relate to one another. The advent of global networking is fragmenting and re-sorting society into what one author calls "virtual communities." Instead of being bound by location, groups of people can now meet in cyberspace, the noncorporeal world existing between two linked computers. There they can look for colleagues, friends, romance or sex. John Hoag, communications coordinator for BARRNet, the Bay Area Regional Research Network, who began computer networking in 1986, says, "I met more people on-line inside a month than I met in the past ten years."

Have modem, will travel.

The Internet is the most powerful computer network on the planet simply because it's the biggest. It encompasses 1.3 million computers with Internet addresses that are used by up to 30 million people in more than forty countries. The number of computers linked to the Internet has doubled every year between 1988 and 1992; this year the rate of increase slowed slightly to 80 percent. To reach it, one needs only a computer, modem and password. Dan Van Belleghem, who helps connect organizations to the Internet for the National Science Foundation, says, "Nobody has ever dropped off the network. Once they get on they get hooked. It's like selling drugs."

While Internet experts deride the term "information superhighway" as an empty soundbite, the concept works as an analogy to understand how the Internet functions. Think of it as a massive road system, complete with freeways, feeders and local routes. At every intersection sits a computer, which has to be passed through to get to the next computer until you've reached your destination. Any computer on the Internet system can connect with any other computer through the road system. And if the route to your destination is closed, you will automatically take a detour to get there.

The difference between the Internet and the Interstate is that you can go to Finland as quickly as you can go down the block. Once there, you can remotely manipulate the computer to do anything your own can do. You can retrieve a file from it in the blink of an eye.

Today, users can talk to one another, send e-mail back and forth, join arcane discussion groups, tap into libraries in universities from Berkeley to Bern and exchange almost any sort of data, including pictures, sound and text. Recently, a cult movie called *Wax* was broadcast to Internet sites all around the country. While it was black and white and only two frames per second, it was an important first step toward the computer equivalent of cable broadcasting. Also, a radio program is already broadcast weekly on the Net, complete with technology news and a "Geek of the Week" segment.

But it's not all smooth sailing on the sea of information. On most computers, the Internet is hard to use. The arcane commands that run it make little sense to many average users, who can find themselves lost in cyberspace without a map. "The Internet today is still for computer weenies," says Kapor. "But the problem will take care of itself," he adds, because

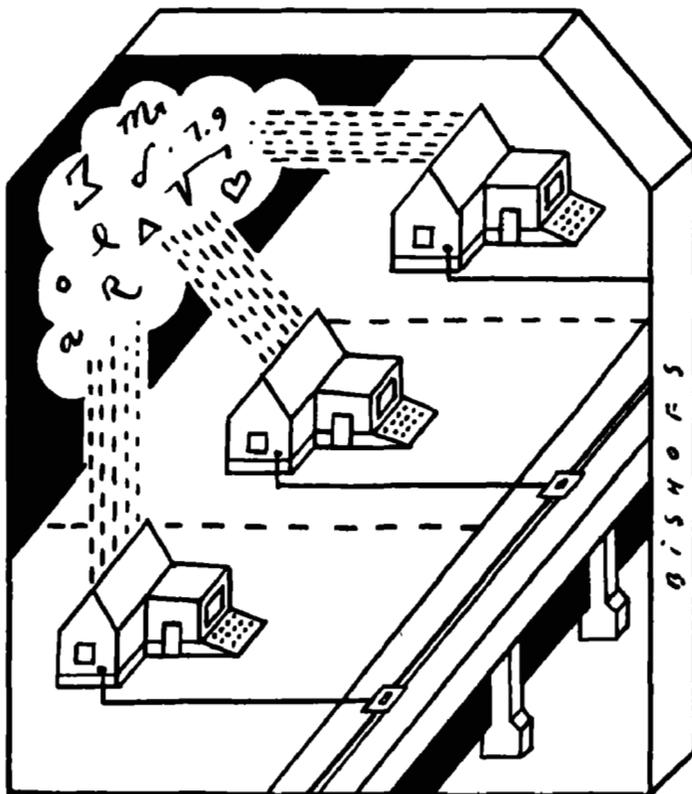
easier to use software tools will appear as the Net grows.

To make matters more confusing, because the Internet is a network of networks, no one group or person is in charge. Kapor describes it as "anarchy." Mandel says, "It's all very ad hoc." And R.U. Sirius, editor in chief of the cyberpunk magazine *Mondo 2000*, says, "It's definitely out of control."

Ironically, the anarchy began in the bowels of the Defense Department. Back in 1969, the Pentagon's Advanced Research Projects Agency created ARPANET, a computer networking project, to transmit packets of military data securely and efficiently around the world. In 1984, the National Science Foundation began building five supercomputers around the country for conducting scientific research. When Defense Department researchers wanted access to the supercomputers as well, the N.S.F. linked them up with ARPANET. The popularity of computer access, especially to collaborate on-line, has steadily expanded ever since.

"It was just a bunch of computer scientists talking to one another," says Van Belleghem. "Then educators and people involved in research or administration all wanted to talk to one another, get files, get to libraries on the network. It's been opening up and getting more open every year." Over the past decade, tens of thousands of nonmilitary networks have been connected to the Internet's electronic web, including the Library of Congress, most U.S. universities and libraries, and private companies from General Electric to the Bank of Bermuda.

Of course, not all the sites are publicly accessible. Most private sites require special passwords for entry, which only registered users and an occasional hacker can get. However, the amount of information available to the on-line public is staggering. "Getting information off the Internet is like taking a drink from a fire hydrant," says Kapor. Everything from the complete works of Shakespeare to the number of sodas in a



Coke machine at Carnegie-Mellon University is accessible.

The primary use of the Net is for communication, however. "Half the traffic on the Internet is e-mail at this point," says Mandel. The number of topics on the newsgroups can be daunting. There are more than 2,500 different subjects, ranging from one for fans of *The Simpsons*, to classified and personal ads, to Bay Area politics.

There are also, naturally, many groups dedicated to different computer systems and languages, as computer scientists and hackers are still the main users of the Internet. One researcher at Cornell who studied the way scientists use the newsgroups discovered that real research isn't furthered much by reading them. Bruce Lewenstein, assistant professor of communication and science and technology studies, found that during the cold fusion controversy, newsgroups did little to aid scientists assessing the phenomenon. In fact, most of the newsgroup postings constituted what he calls "irrelevant chatter." Indeed, in a two-week period in April, the two most active posters were sending erotic images. The White House came in third, with transcripts of press briefings, speeches and press releases.

But some people are using newsgroups to disseminate information from a different perspective. Harel Barzilai, a Cornell graduate student in math, has created a group for progressive activists, and he claims that 23,000 people read his postings regularly. His group ("misc.activism.progressive" in Internetspeak) posts articles from leftist magazines and alternative campus publications, as well as action bulletins on issues of concern. "You're not going to find anything to the left of the Democratic Party on TV or in newspapers," he says. "And for those of us who have access to the Internet, it's free to use it and post information. This is our chance to be heard."

Like many Netheads, Barzilai thinks of the Internet as a new communication model, allowing for unfiltered, many-to-many publishing, rather than the traditional hierarchical one-to-many approach. "This is a situation where money, or capital, does not have a monopoly on access," he says.

R.U. Sirius agrees. "The role of capital as an editor is being removed," he says. Sirius, like many, feels a sense of liberation on the Net. "The metaphor of the highway fits," he says. "Like Jack Kerouac's *On the Road*, from a tight little community out onto the wide open road. Everybody's out there; it's not a small elite system."

Howard Rheingold, whose book *The Virtual Community* is being published in October by Addison-Wesley, says, "If you have a computer, you have the power to broadcast. It gives the power to individuals that used to be only that of the privileged few." And, he adds, the direct access to information the Internet provides is "inherently politically subversive."

These Internet activists want to make sure that this power stays with individuals. Right now a debate is raging in Washington on how to transform the Internet into a faster, bigger network, called NREN, the National Research and Education Network. Funding for NREN began with then-Senator Al Gore in 1991. This year, Congressman Rick Boucher is sponsoring legislation to add on to Gore's brainchild, providing \$1.5 billion in funding to hook libraries, schools and medical facilities to new high-speed computers. Telecommunications and computer companies, including NYNEX and Cray Research, have lined up in favor and a Clinton Administration spokesperson has said that the President is prepared to sign the legislation, which is expected to pass through both houses of Congress this summer.

Megacorporations could determine how much people will have to pay for access.

But one of the main aims of Boucher's bill has alarmed many longtime Net users. It also encourages the NREN computers to use private networks, instead of publicly subsidized ones. Boucher, chairman of the House Science Subcommittee, has suggested that the government should turn over all areas of the Internet to private corporations whenever possible. He says, "The Internet has grown without a clear plan or organization. There's no government for the Internet. One of the great challenges is to establish some means of providing order and giving markers along the way."

By itself, the first move toward privatization means little. Another Boucher-sponsored bill would grant antitrust exemptions for telephone companies, allowing a single company to own both phone and cable lines. Boucher thinks this will provide the financial incentive for the private sector to upgrade the communications links between the Internet and private homes. But critics fear that the end result could be the expansion of local cable and telephone monopolies into monopolies controlling all electronic access into the home.

By giving the private sector unregulated and monopolistic control over the Net's electronic connections, the government would in effect allow megacorporations like AT&T and Time Warner, who own the cable lines and manage what flows through them, to call the shots in the future. They could determine how much anyone, from a single individual to a university, will have to pay for access. Some phone companies, for example, are already discussing charging users either by the amount of time they log on to the Internet or by the amount of data they send over it—despite the fact that their

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network operating costs are fixed no matter how many people use it or how much data flows through it. Changing the funding structure means the eventual extinction of the small, mom-and-pop computer networks, which could find themselves victims of predictable market forces. And that means that isolated users and cash-strapped colleges could be cut off from their virtual communities.

Not everyone predicts such a scenario, however. John Hoag from BARRNet thinks virtual communities will survive even if commercial interests dominate the data superhighway. "The Internet culture has its roots so deep, I don't think it's going to disappear," he says. Even if a local monopoly restricts access to the Net, "the culture will exist around it."

Net users have reacted fiercely to Boucher's proposals, with e-mail flying from Berkeley to Bangladesh. The specter of censorship, as on commercial systems like Prodigy, where system administrators routinely delete "objectionable" messages, looms. "Communities, whether virtual or physical, should be self-determining, rather than determined by megacorporations," adds the Electronic Frontier Foundation's Kapor. "The users of the Net should determine its uses and content." In a worst-case scenario, Rheingold says, corporations would not only monitor what's on the Internet, they would monitor you. If, as some predict, the information superhighway becomes primarily a conduit for watching movies, banking at home and shopping, the same computers that we use to lessen the burden of our daily errands could also be used by the corporations that provide those services to destroy our personal privacy. The Net could be used by marketing wizards—the same ones who flood us with annoying junk mail—to keep tabs on us all in Orwellian fashion, automatically recording our interests and habits.

Hackers have already developed a few defenses, which could be the seeds for preserving the right to free communication. Free software to encode all electronic transmissions is now widely available, with codes that even the fastest supercomputers would have a tough time cracking. This means that nobody but the person you send something to—whether an e-mail note or a piece of software—can read it.

And anonymity is also possible—networks have been set up in such disparate places as Helsinki and San Diego to enable completely anonymous speech. The Finnish operator declared that he will never allow anyone to find out the true names of his users without a court order.

Internet activists are also not happy with the Clinton Administration's effort to impose a standard encoding scheme for data, whether e-mail or a movie, that only the government can break. "The machinery of oppression has weak spots," Rheingold says, noting the spread of encryption techniques that even the National Security Agency may not be able to crack. "But the powers that be in the N.S.A. have convinced Clinton that they have to close the doors before all the cows get out."

Whether it's the government or private corporations, what everyone wants is control of a new form of communication, one that currently cannot be controlled. Given the stakes and the power of the interests now seeking to shape and profit from this new technology, the end result may not be a happy

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one for the average citizen-user. "The key questions of access, pricing, censorship and redress of grievances will be answered in practice, in law, in executive order or legislative action, over the next five years," Rheingold writes, "and will thus determine the political and economic structure of the Net for decades to come."

But for the time being, the activities of people like Wam Kat seem to prove an old hacker adage: "All information wants to be free." □

■ THE 'INFORMATION HIGHWAY'

Public Way or Private Road?

HERBERT I. SCHILLER

An entirely new electronic environment—industrial and individual, factory and household—is being created at an astonishing speed. Who will own it? Who will direct it? Who will utilize it? Who will benefit from it? The evidence of the construction scaffolding is everywhere. The answers to these questions are less easy to find.

"Information technology has penetrated every corner of the U.S. economy," *Business Week* recently concluded, adding that "throughout the 1980s, U.S. business invested a staggering \$1 trillion in information technology." These expenditures increased productivity in manufacturing, services and retail activity.

The electronics, film, TV, cable and information industries have now decided that it is time for the general public to experience firsthand—at our own expense, to be sure—the new electronics. President Clinton and Vice President Gore view the coming efforts to hook up homes as well as workplaces electronically as "a historical turning point" in the capability to "move ideas, data and images around the country and around the world." Gore sees this development as "by all odds the most important and lucrative marketplace of the 21st century."

Another booster is Apple Computer's chairman, John Sculley. He estimates that the revenue that will be generated by the merging of television, telecommunications, computers, consumer electronics, publishing and information services into a single interactive information industry could reach \$3.5 trillion worldwide by the year 2001.

The almost daily reports of gigantic deals, mergers, industry crossover combinations and announcements of government approval confirm that a social transformation of truly epic proportions is under way. Promoted by a variety of high-tech electronic interests, it is being thrust, want it

or not, need it or not, on the people and the economy.

This development represents far more than routine corporate restructuring, industrial realignment or familiar patterns of industrial concentration, though all this is happening as well. What is rapidly taking shape beyond this is an electronically organized total environment that encompasses individual, household, business and work practices in their totality. Its major components will be the information highway and the new electronic gadgets that will feed into it. Some features of this electronically administered social space are already discernible.

It will be an almost exclusively privatized social landscape. The public and the public's interest, if not entirely excluded from consideration, will at best be given marginal attention. In fact, what was once the public sector is on the way to extinction. The deals are between giant companies. Government intervention, when present, occurs only to reconcile divergent corporate interests or to provide subsidies for projects not yet commercially viable. With respect to high definition television, for example, the Federal Communications Commission has been "prodding the rivals to bury their differences and form an alliance," according to a report by Edmund Andrews in *The New York Times*.

The privatization of the electronic economy is well under way. The Clinton Administration's 1994 budget bill includes an unprecedented proposal to sell frequencies of the radio spectrum, a unique natural (and national) resource. Today, Democrats and Republicans alike strongly support selling part of the spectrum, justifying it as a fundraiser and estimating that as much as \$7.2 billion may be realized from the auction. Under this reasoning, why not put the Great Lakes, the Rocky Mountains and the national parks on the block?

The proposed sell-off of public property is being extended to the existing national electronic network. An important part of the Clinton Administration's program has been to call for a National Information Infrastructure, which is intended to link every business, home, school and college in a communications network. Such a network, at least in partial form, is operating as the Internet [see Kevin Cooke and Dan Lehrer, page 60].

The Internet, established with government funds in 1969 and now serving, at minimal cost, up to 30 million computer hands, is performing some of the work that the Administration claims it wants to have expanded. The Net is currently handling scientific communication, some data transmission, bibliographic material and electronic mail. An upgraded national electronic network will have the capacity to transmit far greater amounts of material (including television and film) more rapidly and with interactive service, allowing the receivers/viewers to make choices and selections.

The Internet could be the basis of a free social information facility in the electronic era, yet it is being divested of its public character. Administration-approved proposals to privatize the Internet are moving through Congress. Some see privatization of the Internet as a threat to the continued availability of the network at reasonable cost to educational users. A vice president of EDUCOM (a communications consortium of colleges and universities) observes: "There's entirely too much

Herbert I. Schiller is author of an updated edition of Mass Communications and American Empire (Westview) and co-author with George Gerber and Hamid Mawanu of Triumph of the Image: The Media's War in the Persian Gulf (Westview).

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