BOOK REVIEW

GLOBAL NETWORKS: COMPUTERS AND INTERNATIONAL COMMUNICATION

Edited by Linda M. Harasim.[1]
Cambridge, Massachusetts: The MIT Press. 1993.
Pp. 411. $29.95 (hard).

INTRODUCTION

Some subjects defy easy encapsulation and neat taxonomy. While they appear intriguing from afar, as one draws near one is enveloped in a fog. A structure looms, we reach out to grab it, and it vanishes. Global communications networks—now a topic of heightened academic and commercial interest due to technological, cultural, and political changes —are among these murky subjects.

How, then, does one set out to create a book about these ephemera? Linda M. Harasim, the editor of *Global Networks: Computers and International Communication (Global Networks)*, approached this problem by assembling under one cover writings by a diverse group of scholars, jurists, technologists, business people, economists, commentators, activists, and lobbyists. The resulting amalgam gives a fair indication of the many aspects to the current global telecommunications phenomenon. At the same time, the book sends a sobering message about the difficulty of any attempt to freeze the frame on protean international networks—an attempt that must be made by anyone who wishes to analyze, describe, control, regulate, or profit from global networks.

Despite the degree of variation between the essays that Professor Harasim collects, two broad themes emerge from a reading of her book. First, in their modern incarnation, global communications networks offer tremendous promise. Second, this promise, unfortunately, is a double-edged sword; the price of the many new possibilities seems to be at least as many new forms of problems and challenges. This review addresses

---

1. Professor, Department of Communications, Simon Fraser University, British Columbia.

each of these themes in turn.

I. THE PROMISE

A. A New Society

As the costs of international information links decline, as capacity increases, and as connections, channels, and "end-users" proliferate, global networks inspire utopian visions. But what form will the "telecommunitopia" of the next century take? Howard Frederick, the former director of a human rights network called PeaceNet, suggests that new forms of international communications and related technologies will promote—indeed have already begun to promote—the emergence of a "global civil society" (p. 284). Global civil society represents a layer of social ordering apart from market and traditional governmental institutions. It is not a political jurisdiction, but rather a form of "global nonplace" (p. 284) in which ad hoc international coalitions, enabled by a low-cost electronic web, join forces to confront "planetary problems whose scale confound[s] local or even national solutions" (p. 284).

According to Frederick, this meta-society will not grow out of the activities of centralized institutions that now largely control information, such as governments, media conglomerates, and telecommunications providers (p. 288). Rather, utilizing a "worldwide metanetwork of highly decentralized technologies—computers, fax machines, amateur radio, packet data satellites, VCRs, video cameras, and the like" (p. 288), the constituents of the new civil society will "construct a truly alternative information infrastructure" (p. 294). Bridging the gap between "the info-rich and the info-poor," "reaching the hearts and minds of sympathetic populations around the world," and tapping into "world public opinion," this alternative construct will lead toward perfection of the traditional Anglo-French democratic order (p. 294). The future promises to bring a "'preferred' world order of democratic change [that] depends heavily on the efficiency of communication systems" (p. 294).

Others predict the development of new social forms, not as alternatives to traditional institutions, but as developments that build on and surpass old models. Professor Shumpei Kumon and Izumi Aizu, two Japanese academics, suggest that the twentieth-century age of industrialization is drawing to a close and that we have entered a new wave of social evolution, which they call "informatization" (p. 313). In contrast

to prior periods, the driving force of this new period is not matter and energy, but rather information and knowledge (p. 314).

Like Frederick, Kumon and Aizu believe that the age of "informatization" will produce a new civilization that transcends national boundaries, which they call "a global hypernetwork society" (p. 323). This new society will eschew "the nationalist pursuit of prestige and the capitalist pursuit of wealth" in favor of "competition to acquire wisdom or intellectual power of influence" (p. 317). While the process by which this new utopian order will emerge remains shrouded in uncertainty, it is already evident to these authors that: "Post-modern civilization is likely to place a high value on inclusiveness and collaboration and on harmony with and adaptation to the external environment. It is also likely to be oriented toward continuity and stability rather than progress and development" (p. 317).

In an intriguing discussion, these authors introduce the "information rights" that will largely displace traditional individual rights at the "infostructure" of the global hypernetwork society (p. 318). The focus of these new rights will not be the protection of traditional forms of personal property, but instead the establishment and maintenance of new social agreements concerning the manipulation and ownership of information (pp. 318-19).

Kumon and Aizu present a credible argument that changes brought about by global communications links have begun to transform our institutions, the social agreements that make our institutions possible, and the individual rights that underlie these agreements. However, they are less successful in attempting to convince the reader that the logical outcome of these changes resembles the sort of utopian society projected by their model. They fail to make clear just why it is that the global hypernetwork society will bring about "inclusiveness" (p. 317), a higher state of social harmony (p. 317), or a more sustainable, environmentally friendly civilization (p. 321). One is left to suspect that at some point in the analysis, the thoughtful discussion of identifiable economic and social trends leaves off, and yearning for a particular vision of the future takes over.

Mitchell Kapor and Daniel Weitzner, of the Electronic Frontier Foundation, a public-interest advocacy group, present a somewhat more grounded and limited vision of an idealized transnational social order rooted in network technology. If implemented correctly, this new tool for social ordering, the International Public Network ("IPN"), would

eventually become "an interconnected confederation of numerous networks, all of which serve different needs" (p. 299). Once developed, the IPN could utilize "computer-infused communications technologies and the digital media that ride atop them . . . to enrich our collective cultural, political, and social lives and to enhance democratic values in our society" (p. 299).

Kapor and Weitzner are sober about the labor that will be required in order to realize, or even approximate this social vision. Moreover, they are not afraid to acknowledge some of the risks of failure: too little social diversity (p. 299), too little social homogeneity (p. 299), inadequate access (p. 299), erosion of local character (p. 299), creeping censorship (p. 303), economic monopoly over "electronic social environments" (p. 299), fragmentation of the IPN due to incompatible local standards (p. 301), and the possibility that local policies may have deleterious effects on the network as a whole (p. 309).

Though they differ from other networking utopians in that they do not affirm that their vision of the international networked future is a technologically preordained certainty, Kapor and Weitzner do articulate a mouth-watering set of possibilities for a social order that is technologically possible, and might even be realizable if we address a host of cultural, institutional, and political obstacles. By offering at least a general blueprint for an approach that confronts these obstacles, their essay has the virtue of setting an agenda for action, rather than merely wishing or assuming the desired global-networked society into existence.

B. A New Community

Global Networks thus presents several visions for a communications-based social order that transcends national boundaries and aspirations. In contrast to these grand visions, several essays identify the potential for global networks to alter social structures at the local community level.

John S. Quarterman, a network-technology commentator and consultant, implies that with the advent of global networking, we will witness the spread of new forms of community that are "distributed" and "asynchronous" (p. 48). These communities will be diverse, with an inherently egalitarian tendency (p. 48). A globally networked community would develop its own cultural flavors, and perhaps even evolve its own language—"some new Creole" (p. 53).

Author Howard Rheingold makes a detailed study of the mores and

characteristics of the "virtual communities" enabled by global-networked communications services. Using a pioneering on-line service, the WELL (Whole Earth 'Lectronic Link), as a field site, Rheingold attempts to describe the "place" of an on-line community and to identify the functions such a community might fulfill in our lives. Rheingold notes that "the automobile-centric, suburban, high-rise, fast food, shopping mall way of life" has diminished the importance of many of the places where people traditionally gathered for conviviality and casual conversations, such as cafes, beauty shops, pubs, and town squares (p. 65). As a result, the social fabric of our traditional communities has "shredded" (p. 65). Rheingold argues that on-line communities hold out the promise to resurrect and rekindle the important exchange that once took place in these informal fora (p. 65).

Moreover, on-line communities have several advantages over their terrestrial counterparts. Because the denizens cannot see one another, the community resist the taint of race, gender, age, ethnic, or physical prejudices (p. 66). Timid people who might be wallflowers in a physical community can blossom and perorate in the virtual community (p. 66). Those with physical handicaps have easy access to all the essential facilities (p. 66). The ties within such a community tend to be particularly strong: First, because unlike in the physical world, you can get to know people before you choose to meet them (p. 66), and second, because in an on-line community one chooses one's associates based on common interests and goals rather than by "accidents of proximity" (p. 65). Moreover, one's participation in an on-line community is enhanced by the ease with which one can "fractur[e] traditional notions of identity by living as multiple simultaneous personae in different virtual neighborhoods" (p. 61). Frederick elaborates on these virtues by describing the way in which global networks expand our sphere of useful relationships: "No longer is community or dialogue restricted to a geographical place. With the advent of the fax machine, telephones, international publications, and computers, personal and professional relationships can be maintained irrespective of time and place. . . . Today we are all members of many global 'nonplace' communities" (p. 284). Frederick has no doubt that this state of affairs is superior to the world of the medieval peasant, who typically never ventured beyond the locality of his birth, and who "knew of the world only through travelers' tales" (p. 284). We are apparently left to take this superiority on faith.

Rheingold's outline of the potential for on-line communities, too, tends

to glide too easily across some of the flaws and difficulties they pose. For example, in praising the diversity of on-line communities (p. 66), he fails to notice that such communities may well impose a new dimension of exclusivity on society. Another problem with Rheingold's analysis is his thin explanation of how these communities actually function. Admittedly, his brief presentations of the "unspoken social contract" (p. 68) and nurturing "gift economy" (p. 69), that he says undergird the new forms of community, do not pretend to be comprehensive theoretical explorations of these concepts. However, one is left with many questions and doubts as to why an enlightened "marriage of altruism and self-interest" (p. 68) and a unique cooperative spirit (p. 69) should perfuse on-line communities when such virtues elude what Rheingold portrays as the mercenary social realm of ordinary life.[2] As happens frequently in *Global Networks*, Rheingold succumbs to the temptation to substitute wish-fulfillment for skeptical observation of social relations as mediated by a new technological medium.

C. New Organizations

Most who consider the subject believe that global networks will alter, and continue to alter, workplaces and other organizations. *Global Networks* contains several inquiries both into the nature of entirely new organizational forms and the changing transactions within existing organizational forms.

One common thread running through these inquiries is the conclusion that the flow of information facilitated by global networks and related technologies sounds the death knell for large, centralized, rigidly hierarchical organizations. As Kumon and Aizu write: "Instead of large bureaucratic organizations in the twentieth-century, network type systems in which large numbers of small teams can cooperate and compete on the basis of loose and flexible bonds may be most effective" in the new context (p. 315).

Lee Sproull and Sara Kiesler suggest that while hierarchy will not vanish, "it will be augmented by distributed lattices of interconnections" (p. 117). Furthermore, "eliminating the constraints of face-to-face

---

2. Lee Sproull and Sara Kiesler identify a similar phenomenon of "electronic altruism" and argue that it results from the low costs required in time and effort for a response to an electronic plea for assistance. (p. 116).

meetings" will facilitate "trying out different forms of group organization" (p. 114). New patterns of information sharing will erode the rigid distinction between formal manuals, procedures, and record-keeping systems, on the one hand, and war stories, folklore, and gossip on the other (p. 114).

Professor Marvin Manheim, too, sees fundamental changes in organizations. Global networks will permit organizations to be fluid, with purpose-formed teams of various kinds that "come and go as issues arise and are resolved, or opportunities are perceived and seized" or, presumably, abandoned (p. 124). Flexible design, manufacturing, sourcing of inputs, research and development, customer support, and marketing will be necessary if organizations are to remain competitive in an environment of reduced inventories, condensed business cycles, and customization of products and services according to particularized consumer needs (pp. 122-24).

The organizational shift that appears to be mandated by globalizing technologies will no doubt produce headaches for managers as they try to adapt to a new landscape. But how will these changes affect workers? Harasim suggests that we may be happier working in the new organization, which has the potential:

> to enhance the horizontal dimensions of organizational life,
> in which management has reduced its needs for control and
> encourages nonhierarchical communication in which individ-
> uals are augmented by their participation in group life and
> in which work and play, productivity and learning, are ever
> more inseparable. (p. 31)

D. A New Polity

"Electronic democracy" has become a media buzzword, but the impact of modern communications technologies on political processes is difficult to fathom. *Global Networks* reveals less agreement among assessments of political impact than perhaps in any other area. Nevertheless, most discussions are hopeful and predict that new communications technologies will enhance our political culture.

Writers frequently avow that electronic communications have an egalitarian and liberating power. British communications researcher Robin Mason points to the opening of Eastern Europe as an example of

a political transformation wrought in part by communications; according to Mason, e-mail messages, which relayed events and emotions, had a role in dismantling the iron curtain (p. 199). Mason conjectures that "[i]t is no longer possible for governments to retain control over the dissemination of information" (p. 199). Rheingold, too, assigns to communication technologies a role in the "disintegration of communism," in limiting the political repression at Tiananmen Square, and in thwarting the Soviet coup attempt (p. 78).[3]

In a similar vein, Quarterman believes that network technology is inherently populist. He states, without appearing to support the conclusion, that secrecy is difficult or perhaps impossible to maintain in a networking context. Therefore, he argues, one of government's primary power mechanisms is crippled (pp. 48-49). One may well find Quarterman's conclusion that electronic networking has "grown past the control . . . of any government" (p. 49) too facile. After all, an extensive literature has grown up detailing the uses of computer network technology by governments, and particularly by law enforcement, as a tool for increasing control over citizens.[4]

---

3. Like Rheingold, Howard Frederick cites the examples of Tiananmen Square and the 1990 Soviet coup attempt as the salient instances of the "large scale impact of these decentralizing technologies on international politics" (p. 292). After the Tiananmen Square massacre, Chinese students "transmitted detailed, vivid reports instantly by fax, telephone, and computer networks to activists throughout the world. . . . Their impact was so immense and immediate that the Chinese government tried to cut telephone links to the exterior and started to monitor the USENET computer conferences" being used by the students (p. 292). During the attempted coup in the Soviet Union, meanwhile, the resistance "used telephone circuits to circumvent official control" (p. 293).

4. *See, e.g.*, Nicholas de B. Katzenbach & Richard W. Tomc, *Crime Data Centers: The Use of Computers in Crime Detection and Prevention*, 4 COLUM. HUM. RTS. L. REV. 49, 50 (1972) ("Perhaps the most significant development in crime technology . . . has been the use of computer data banks to store, classify and retrieve vital information on criminal suspects and stolen property."); Robert Garcia, who argues that:

> [C]omputers are making the government more powerful in its efforts to fight crime. Computers can increase the speed and efficiency of many law enforcement tasks, ranging from routine mechanical tasks like record keeping to complex activities like conducting electronic surveillance. Computers can also go beyond simple automation to provide new levels of understanding and insight into what is observed. Computers can automatically and continuously record and flag almost anything their designers want to capture. Massive amounts of data can be organized and sorted to reveal complex criminal patterns, schemes, relationships, and violations that would otherwise go undetected. How information is stored, retrieved, and manipulated is no longer dependent on how much a person can remember or comprehend. Computers can help make cases; they can strengthen otherwise weak cases, and they can help prosecutors master complex cases.

Quarterman's logic also fails to come to terms with the potentially damaging effect of increased private control on the political process. Anne Wells Branscomb observes that transaction-generated information, such as telephone records, "can be mixed and matched with census data, postal codes, and other publicly available information such as automobile and boat registrations, birth registrations, and death certificates to provide rather precise profiles of potential buyers of a variety of products" (p. 87). While the book does not pursue the potential of profiling techniques and other private uses of data to inflict political harm, it would be a mistake to assume that the only threats to political freedoms are those that originate in the public sector.

Other contributors find that the political significance of international communication networks lies not in their potential to shift the balance of power between citizens and their governments, but rather in their inherent tendency to promote a liberal, democratic ideology. Frederick, for example, asserts that communication and information foster "the emergence of democratic, decentralized, planet-loving movements" (p. 295). He wants us to believe in the "decentralizing and democratizing qualities of new computer technologies [that are] benefiting a growing global movement for the common good" (p. 286). But once again, this portrait seems more a wish than a reality. Kapor and Weitzner believe that new communications technologies carry the potential "to enhance democratic values in our society" (p. 299). Rheingold, too, seems to detect an inherent liberating tendency in our new tools (p. 78).

Global Networks lacks a tough-minded skeptic who could really test these arguments. Even if one acknowledges that the anecdotes that Frederick, Quarterman and others adduce demonstrate a potential for communication technologies to exercise a liberating influence, one might wonder how much weight to give to this anecdotal evidence. What prevents powerful global networks from serving the ends of repressive, censorious, totalitarian, or criminal institutions? Would the efficiency and flexibility of these networks not equally tend to advance ideological goals antithetical to liberty and democracy?[5] None of the authors dwell on such

---

"Garbage In, Gospel Out": Criminal Discovery, Computer Reliability, and the Constitution, 38 U.C.L.A. L. REV. 1043, 1048 (1991) (citation omitted).

5. There can be no doubt that computer networks have been useful to nefarious organizations. White-supremacist skinheads across the United States, for example, reportedly use an on-line bulletin board called the Aryan Nations Liberty Net in order to communicate and to coordinate their activities and even to target individuals for extermination (p. 90).

perturbing possibilities, nor is a convincing case made for why a liberating tendency is intrinsic to global communication networks. In the end, there seems little proof that these webs are any better (or worse) than the people, organizations, and institutions that make use of them.

II. THE PROBLEMS

A. Security

The vulnerability of networked information to various incursions —viruses, theft, misuse, corruption, loss—is well known. Such problems have proved intractable even at the national level. Australian Judge Michael Kirby and Canadian Professor Catherine Murray make a convincing case for the need for an international regime for security of information systems (p. 168). The authors, however, are quick to point out that this objective will not be easily achieved, as evidenced by the failure of the Warsaw Convention[6] limiting liability of international air carriers (p. 168).

Several initiatives are underway, but the authors argue that more must be done. The Organization for Economic Cooperation and Development Guidelines on Information Security, for example, are an attempt to establish a voluntary framework for harmonization of national data protection legislation (p. 181). In 1991, the Council of the European Communities issued a report outlining an EC framework for the security of information systems (p. 179).

Unfortunately, none of these efforts has achieved much success; it has proved difficult to bring Europe under a common umbrella of binding data protection rules, laws, and standards. If Europe has trouble adopting a common policy, one is left to doubt the prospects for a *global* network security regime any time soon. The authors recognize the "cultural impediments to achieving policy consensus" (p. 181). Perhaps developing such consensus on a global scale is the sort of large, dispersed, multicentric problem that the new global networks will make us better at solving.

---

6. *See* Robert Rice, *Airlines Opt To Fly on a Wing and a Prayer: Compensation Leaves Travellers Cold*, FIN. TIMES, Nov. 23, 1993, at 12.

B. Scarcity

Electronic networks threaten to imprint on society a new realm in which power, privilege, and prestige will be controlled by elite individuals and institutions. Kapor and Weitzner note that members of CompuServe and Prodigy, two of the most popular online information services, "are overwhelmingly white, upper-middle-class men" (p. 304). Nevertheless, Kapor and Weitzner are confident that if we adopt the appropriate policies, the benefits of powerful communications tools will trickle down to the masses, much as printed books, once available only to the elite, eventually became common devices (p. 304).

Others, however, are not so sure. Harasim, for example, foresees a strong possibility that networks will "be used to segregate the 'info-rich' from the 'info-poor'" (p. 33). "Economic disenfranchisement," she predicts, "may be the greatest challenge that looms for the global network" (p. 33). Frederick cites some disturbing statistics that portray "the increasing gap between the world's info-rich and info-poor populations" (p. 287). It gives one pause to read that "[t]he United States ha[s] as many telephone lines as all of Asia; the Netherlands, as many as all of Africa; Italy, as many as all of Latin America" (p. 288). In the United States, meanwhile, "white children are 2.5 times as likely to have home computers as African American and Hispanic children" (p. 288).

One glimmer of hope, albeit slender, emerges from an essay that describes the modest success of efforts to establish a cluster of South-South educational, scientific, and social development research networks known as BESTNET, AFRINET, and EASANET (pp. 237-54). These networks link universities and scientific research organizations throughout the African continent, Latin America, and other emerging regions. They also provide links to the developed world (p. 242). While implementation of these embryonic links remains spotty, their rapid improvement may help strengthen ties within the developing world and allow scientists there to exchange information on subjects of specific concern to these societies, such as cooperative development (pp. 247-48).

C. Tower of Babel

It is possible that humans are simply incapable of organizing, coordinating, and operating a complex telecommunications and computer network on a global scale without miring the project in complications.

Jeffrey Shapard is typical of those contributors to *Global Networks* who fret that these promising global webs will snare on the barbs of regionalism, ethnocentrism, and cultural friction:

> [A]s we sail the electronic seas and explore, settle, and develop the virtual world online, we face many of the same issues that our ancestors have faced in the past as their cultures collided with those of others, and as they discovered whole civilizations built upon vastly different assumptions. . . .[If we do not take account of these differences in designing new networks,] we can stumble along in the blindness of our own narrow biases and wonder why this technology leaves us isolated from others rather than living up to its promise of greater connectivity. (p. 270)

Quarterman reminds us, meanwhile, that networks, no matter how universal, will not necessarily dissolve that age-old barrier to international communication—the Babel of national tongues (p. 53).

Branscomb, too, provides a useful reality-check by revealing just how vexing the "jurisdictional quandaries" for global networks can be (pp. 89-103). She observes that though unencumbered movement of information is necessary to a global networked economy, "there are no generally recognized principles governing access to data stored or in transit across national boundaries" (p. 89). The result is conflict between global networks and the national legal systems, national regulatory structures, and to some extent national telecommunications systems that control their operation (p. 89). To make the system run smoothly, it is necessary to achieve a high level of reciprocity, harmonization, dispute resolution, and cooperation. Unfortunately, these goals often prove difficult to achieve, as evidenced by the massive efforts to reconcile the world's legal regimes governing intellectual property rights (pp. 91, 100-02).

Because we lack an international judicial body with enforcement power over global networks, the activities on these networks are regulated entirely at the national level. Branscomb points out that this state of affairs has generated monumental confusion and frustration. Among Branscomb's examples of the unfortunate results when national legal systems clash over the treatment of internationally networked information is that of the Miami branch of a Canadian bank that was ordered by a U.S. court to produce financial data stored at subsidiary branches in

various countries. The fact that the laws of two of these countries prohibited disclosure of the data in question did not prevent the U.S. court from assessing nearly two million dollars of fines against the bank for its failure to produce the data (pp. 90-91).

Along the same lines, Beryl Bellman, Alex Tindimubona, and Armando Arias, Jr. provide a vivid example, in the context of African networking, of the damage that national regulation can do to a transnational data network. The problem, which they call "the last mile" (p. 245), "is a combination of national governmental policies that restrict transborder flows of information and local level politics within and between institutions that restrict usage either by refusing access to the technology or by making access too difficult for easy use" (p. 245). As a result of this balkanized regulatory regime, the costs of some international connections within Africa "are so expensive that they are restrictive except for banks and a few other private, for-profit enterprises" (p. 245). Frederick might argue that technology will inevitably provide a low-cost alternative to such obstacles (p. 294). Perhaps, but for the moment it appears that the Babel of conflicting jurisdictions and competing legal systems considerably dilutes the benefits that global networks might bring, particularly to less developed parts of the world.

D. "There's No There There"

A final problem that surfaces in several of the discussions has to do with the fact that global networks can only be as valuable as the content they transmit. Caught up in the speed and scope of these wondrous webs, it is easy not to peer too closely at the actual uses to which they are being put.

Educational researcher Margaret Riel, underscores this point in her discussion of the potential for networks to become a powerful learning tool and to facilitate "global education" (p. 221). She describes how, using networks, students could place difficult social problems in a global context in "a search for answers within complex economic, political, environmental, cultural, and social systems" (p. 233). She cautions, however, that such goals will not easily be achieved: "Computer networking offers the possibility of developing a stimulating cooperative context for teachers and students. But it is the quality of the dialogue on the network and not the speed of the technology that will be the crucial factor" (p. 236). Difficult as it may be to overcome the physical,

cultural, and regulatory stumbling blocks to the global-networked future, the ultimate challenge may be that of turning these powerful systems into truly human, truly humane tools.

CONCLUSION

A few criticisms of *Global Networks* should be advanced. Those sensitive to the integrity of the English language will cavil at the trendy newspeak that creeps inevitably into writing about computerized communications. Some readers will cringe, for instance, at Rheingold's reference to electronic propaganda as "disinfotainment" (p. 78). In addition, in some essays, the acronyms and industry-lingo become so dense that one feels the urge to cry, "Beam me up, Scotty!"—as in this sentence from Jeffrey Shapard's discussion of Japanese character codes: "[T]oday, in addition to the two-byte, seven-bit JIS C6226 and JIS X0208/X0202 kanji codes, various two-byte, eight-bit proprietary variants in the mainframe and minicomputer environment, and the two-byte, eight-bit EUC in the UNIX environment, there is also the mixed-byte, eight-bit Shift-JIS on millions of pasocom and waapuro" (p. 259).

A more serious problem, perhaps reflecting the open-ended nature of global networks themselves, is that the variety of approaches taken, disciplines deployed, styles used, and subjects discussed in this book can weigh on the reader. One longs for a cleaner organization of a subject that is elusive and difficult to quantify. It may be that global networks are in such an embryonic state that the idea of mature reflection on them is wildly premature, and that Harasim has produced the sort of rough-and-ready account that must precede further refinement and digestion of the subject.

Having voiced these complaints, it must be said that anyone seeking to penetrate the mysterious nature of global networks and their possibilities, traits, and limitations, has little choice but to lay hands on *Global Networks*. The book contains a rich trove of source material and could serve as a seedbed for analysis of transnational computer, communications, and media developments.

Perhaps chief among the useful insights contained in *Global Networks* is the overall feeling for these networks that one takes away. They are not fixed, objective enterprises, like the network of interstate highways in the United States, but rather a skein of channels, capacity, and connections that largely remains to be organized, shaped, distributed

where it is needed, and given useful jobs to do.

Steven A. Bercu[7]