moved because of cataracts can then see in the infrared (I didn't know that). Most of his examples are less mundane, showing (and showing off) Slobodkin's broad erudition in art, music, literature, religion, and, of course, science (Slobodkin is a professor of biology at the State University of New York at Stony Brook). His writing style is sometimes a bit pedantic. Instead of saying it ain't wise to beat the boss at golf, he describes "the golf game between a boss and an employee in which there are economic penalties to the employee if he wins." He is also constantly telling us what the next few chapters hold in store. On the other hand, he can be amusingly ironic: "There are also places in which whole groups can reject most of the world's flow of information— bars, synagogues and churches, congressional and parliament buildings, sailboats, squash courts, and the better colleges."

This is a very personal book, and, perhaps inevitably, we learn as we go along a great deal about the author: he grew up in the East Bronx, has a three-year-old grandson, has a dog but doesn't like cats, and so on. In fact, in the end, whether you like the book or not will depend on whether or not you come to like the author, with all his menagerie of stories and his idiosyncrasies. He ends his introduction by saying, "I hope you have as much pleasure in the reading as I had in the writing." Not all readers will get quite that much pleasure out of the book. Nevertheless, many will find it worth the price of admission.

David L. Goodstein
California Institute of Technology,
Pasadena, CA 91125

■

Technocultures

The usual way of thinking about technology and the scientific knowledge that undergirds it is to regard them as mere tools, value-free instruments with which we accomplish tasks. Andrew Ross in *Strange Weather* sees technology and science a different way, both as products and as shapers of cultures. The book has many goals, as literature, political judgment, and interpretation regarding connections among power, meaning, culture, and technology. Space limitations and predilection lead me to neglect his literary efforts, and most of his political ones as well.

The book is cultural criticism, focusing on what Ross calls oppositional technocultures. Though not formally defined, oppositional technocultures are values and beliefs adopted by certain strata or groups that claim to contest "official scientific cultures." They are, in other words, people who are concerned with science and technology but who oppose institutionalized science and who dispute, on the surface at least, expert authority. Ross's cultural stories are about New Age, computer hacking, cyberpunk, science fiction, and futurology, to mention but a few.

The beliefs and values of all the cultures Ross dissects are too numerous and too disparate—and his analyses too intricate— to explicate in a review. I'll describe two of them and Ross's reading of them to give you a flavor of what the book tries to do (the book has six chapters, each devoted to one major technoculture, though each chapter has ruminations on many themes).

New Age ideology emphasizes individual rather than collective well-being and asserts a holism between body and mind. In their search for holism New Agers talk of channeling and brain gyms, of altering brain waves to "balance the left and right brain in holistic synchrony" (p. 31). New Agism insists on the inseparability of physical and spiritual realities, which suggests the notion that the body itself has intelligence. This raises the possibility of communicating with inner as well as outer space. As Ross puts it with characteristic wit, "Talking with DNA is the corollary of talking with E.T." (p. 35). New Age thinking claims that Western science, with a narrow, overly technical way of understanding, wrenches illness and disease out of context, which limits its ability to enhance health and well-being. There are even some New Agers who maintain that it is not AIDS that makes people ill but "our negative overreaction to the virus" (p. 51).

How to interpret such stuff? Ross urges us not to dismiss such notions out of hand but to look for the deeper meanings indicated by countercultural claims. To be clear, Ross does not celebrate New Age ideology, or any of the other ideologies he interprets. Indeed, he is just as critical of oppositional cultures as he is of "the dominant scientific paradigm." He points out, for instance, that, rather than advancing an alternative worldview, New Age has developed a conception of rationality that complements rather than opposes established scientific culture. New Age ideas, then, "at once contest and reinforce dominant values about human and technological growth and development" (p. 21).

Ross finds politics in places most of us wouldn't think to look. His political interpretation of computer hacking is especially clever. Consider, for example, the 1988 computer virus spawned by Cornell student Robert Morris, which infected the DARPA network via Internet. The attack signaled increased media, corporate, and legal attention to electronic breaking and entering. It also spurred "viral hysteria," which has in turn engendered two main effects. First, the hysteria helped produce a "windfall for software producers" of both anti-virus programs and the programs vaccines are meant to protect. Second, virus hysteria nourishes the view that information, along with information technology, is naturally a proprietary matter. Yet it was the hacker counterculture that pioneered the personal computer revolution in the first place, and that counterculture was based on shareware, copying, and open architecture. Ross goes further, exploring how hackers, once defined as daring innovators, came to be defined as a new class of deviants, even enemies of the state. The insight here is that hacking has come to be seen as a problem of "trespass," which restricts public, legislative, and political discussion about hacking to issues of privacy and private property. The problem, from Ross's point of view, is that such a restriction "closes off any examination of corporate owners' and institutional sponsors' information technology activities" (p. 83).

Thus in Ross's hands hacking is much more than deviant pranksterism. Hacking is a fundamentally social and political act, one that challenges dominant institutions because it denies official definitions of knowledge ownership. It is not fortuitous that hackers' most prized targets are the police, defense agencies, and other agents of the institutional world. Hackers hew to an ideology that is libertarian in its approach to technology and knowledge. They want to decentralize it, open it to a wider circle of consumers. Ever ironic, however, Ross notes that hackers not only challenge but support dominant culture. That is, even as they engage in digital class struggle, hackers adopt an American, high-tech work ethic, one that celebrates "high productivity, maverick forms of creative work energy, and . . . on-line endurance" (p. 90).

Ross's critical analyses of different visions of the future created by alternative technocultures is interesting. His lucid, carefully reasoned arguments will enlighten anyone concerned with science, technology, and culture. The stories, which demonstrate the creativity and even rationality of out-of-the-mainstream groups, should entertain scientists and humanists alike.

Lee Clarke
Department of Sociology,
Rutgers University,
New Brunswick, NJ 08903-5072