

Paul N. Edwards. *The Closed World: Computers and the Politics of Discourse in Cold War America.* Cambridge, Mass.: MIT Press, 1996. xx + 440 pp. \$36.00, paper, ISBN 978-0-262-55028-4.



Reviewed by Bill Olbrich

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This book is a hard read, requiring close attention to nuances, but the effort yields starkly unsettling results. Paul Edwards' *The Closed World* braids several exciting story lines into a cautionary history that unfortunately collapses just short of a conclusion. Edwards adroitly chronicles the first half-century of electronic computers, the information sciences, and their literatures in American life. He documents the rise of the electronic digital computer over the mechanical analog computer, cognitive psychology over Freud and Skinner, and artificial intelligence over mechanical neurology in studying the human mind. Edwards is especially adept at showing the intimate connections of these disciplines throughout the post-war era.

Edwards makes good use of existing histories, memoirs, and personal papers in telling his insider history. MIT graduates and professors such as Vannevar Bush, George Valley, Claude Shannon, and J.C.R. Licklider are the human heroes of the book, and Edwards deserves extra credit for emphasizing the roles of such misremembered individuals. He finds their personal recollections

fraught with a teleological faith in progress; these scientists believed that only the inevitable laws of science controlled their efforts. Instead, setting their sagas within the historical contexts of wartime "practical needs, political discourses, and social networks," Edwards finds the scientists actually achieved only incremental changes for specific designs (p. 239). Such tinkering with proto-computerized equipment proved successful in defending convoys against U-boats and warships from kamikazes, and marked the initiation of high technology industrialism.

The hidden designer behind the engineering success stories, Edwards claims, is the U.S. government, in particular the U.S. Air Force. The caution he sounds is the history of how the U.S. military-industrial complex, created of necessity in World War II, retained its power and control by instigating a world-wide Cold War (p. 47). The military-industrial complex includes the military government, the civilian government, large corporations, and academic laboratories. Their siege mentality of command, control, and mistrust infused the very fabric of contemporary American society

and turned America into a closed society. Scientific attempts to solve war-time technical problems, Edwards further stipulates, provided the military-industrial complex with vocabularies of power and control for use among its constituencies.

Edwards tells good stories, and some readers will delve no further into *The Closed World* than these tasty treats. Some anecdotes are bizarrely funny. During the Vietnam War, the North Vietnamese employed tape recording and bags of excrement to fool sophisticated U.S. computer-driven sensors into ordering B-52s to bomb clearings for the Ho Chi Minh trail (pp. 3-4). Some *bon mots* are more troubling. Military security controls academic research grants. The bottom level of secrecy--"unclassified"--does not allow automatic public announcements. Instead, "the responsibility for deciding whether the results should be held secret [falls] upon the researcher himself and his laboratory ... (who, in turn,) ... guard the national interest" (pp 8-11).[1] Thus is Big Science co-opted into supporting a closed society supposedly anathema to scientific thinking.

Edwards actually uses these stories of scientific achievement and blundering not as histories in and of themselves, but rather as evidence illustrating the languages of power and control articulated by the military-industrial complex. These languages arise from their chief source of power, the digital mainframe computer (pp. 8-11, 95, 125, 168-69). These useful servo-mechanisms provide unquestioning obedience with fewer procedural errors than human beings. They further promise either to control all factors of any problem or to provide a mathematical algorithm of acceptable variance. As computers operate within a "closed world" of pre-determined commands and memories, so the military-industrial complex seeks to re-shape American society as a "closed world."

Digital mainframe computers, Edwards contends, grew in strength and ability during the Cold War as the hegemonic forces sought to consolidate their domestic control while simultane-

ously contesting all foreign opposition. One of the Air Force's favorite ploys, according to Edwards, teased American paranoia over Soviet air attacks into huge government expenditures for bomber/missile defenses controlled by computers. "Whirlwind" in the 1940's, "SAGE" in the 1950's-1960's, and "Star Wars" (aka "Strategic Defense Initiative" or "SDI") in the 1980's promised to protect America with mostly imaginary technical abilities requiring billions of real tax dollars. This money fed big business (especially IBM), big science (especially at MIT and RAND), and big government (Defense, NSA, and NASA) with at least some portion of the swag going to digital mainframe computer research. Edwards dubs the bag of propaganda tricks these co-conspirators used to maintain this unabated flow of funds "closed-world discourse," and finds its use permeates American culture (pp. viii, 1, 12). Since Edwards focuses his attention on the military-industrial complex's use of language to maintain its power, he mostly ignores the uses and abuses of that power.

Within the complex itself, Edwards finds another language style he christens "cyborg discourse" (pp. 20-21). A goodly part of his non-anecdotal text space goes to the explication of this language style (150 of 365 pages of text). The phrase itself Edwards lifts from his dissertation advisor at UC-Santa Cruz, Donna Haraway, she of "The Cyborg Manifesto" and "I would rather be a cyborg than a goddess" (pp. xvii, 2).[2] Most times, however, Edwards seems to feel he himself invented the historiographical use of the term "discourse," as he burns many pages in its definition, explanation, and defense; actually, the term as he uses it dates from 1977.[3] A litany of litcrit tropes, genres, metaphors, and plot structures as terms of analysis do little to clarify his theses. At one point, Edwards even advises readers with MEGO (internet slang for "my eyes glaze over") to skip long sections of his theoretical apparatus (p. 27).

Edwards considers cyborg discourse a language of power, emanating from the military-in-

dustrial complex and greatly influencing Americans' subconsciousness. His best commentary particularly befits the medium--the H-Net--of distributing this review. The generalized theory of the communications circuit attributed to Claude Shannon and Warren Weaver is the backbone of all contemporary information science and communications studies (pp. 199-207). Bell Laboratories--using MIT graduates--originally worked up a one-way flowchart for cryptographic work in World War II military command structures. In this setting, "communications" meant "command from a superior to a subordinate," and "noise" meant "anything distorting the command, including human error." Furthermore, the command appeared as noise to everyone other than the intended subordinate receiver. "Feedback" came from the engineering practice of "TOTE" ("Test-Observe-Test-Exit") to ensure a clearly received command.

Bell Labs created a one-way command tool, not a method for understanding dialogue of mutual benefit and improvement. In the military-industrial complex the communications circuit dove-tailed with the paranoia of closed-world discourse and proved useful in Taylorist time-motion studies of keyboard strokes, in spying on employees, and in other micro-management techniques. Starting in the 1960's the communications circuit also provided the theory for the ARPAnet, in the 1980's the BITnet, and in the 1990's the INTERNet.

Edwards completed the dissertation version of this text before the end of the Cold War. He spent the ensuing decade understanding the effects of closed-world discourse and cyborg discourse upon the American character, and not on how the military-industrial complex would wield its power languages without a designated enemy.

Edwards treats the effects of computer integration with the individual psyche--the cyborg--as a new and unique figure in American life. The American cyborg readily determines and alters at will its own gender, its own actions, and its own

relationship to society. Since its machinery components must come from a well-organized technical society, the cyborg is no longer the lonely Cartesian solipsist, but is rather uniquely connected to communities in ways still under analysis. How, one wonders, is this substantially different from the self-defining American character studied from the time of Crèvecoeur?

Edwards ends by considering the computer and the robot in popular fiction and film. He finds the intelligent machine a stock horror character from Capel's R.U.R. to Schwarzenegger's Terminator, making Haraway's benign vision a tougher sell outside certain academic feminist circles.[4] Moreover, Edwards covers only the machine become intelligent, and not the blend of intelligent human with useful machine that properly defines the cyborg. In doing so, he also overlooks the chilling figure from *Star Trek*, the "Borg." Even the fictional Captain Picard's short assimilation with this multi-intelligence entity shows the cyborg to be no solution to *fin-de-siecle* America's gender politics.

Notes:

[1]. Citing Paul Forman, "Behind Quantum Electronics," *Historical Studies in the Physical and Biological Sciences* v18 n1 (1987): 152.

[2]. See also Donna Haraway, "The Cyborg Manifesto," *Socialist Review* v15 n2 (March-April 1985): 65-107; and Hari Kunzru, "You Are A Cyborg," *Wired* v5 n2 (February 1997): 154-159+.

[3]. John Higham and Paul Conklin, editors, *New Directions in American Intellectual History* (Baltimore: Johns Hopkins University Press, 1979), pp. 42-60, 181, 191-192.

[4]. See Suzanne L. Mamarin, "Would You Rather Be a Cyborg or a Goddess: On Being a Teacher in a Postmodern Century," *Feminist Teacher*. 8: 2 (Fall 1994): 54-60.

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