

**Inventing the Internet.** By Janet Abbate. Cambridge, MA: MIT Press, 1999. 264 pp. ISBN 0262011927.

*Inventing the Internet* is University of Maryland history professor Janet Abbate's contribution to the MIT Press' "Inside Technology" series. Abbate's historical account is an attempt to trace the development of the Internet from its genesis in the network technologies of the 1960s to its current status as a popular form of mass communications. In the book's introduction, Abbate identifies two overriding goals or strategies through which she intends to engage her historical subject matter. First, she cautions us on the way in which communications media, as vehicles for the transfer of ideas and information, "often seem to dematerialize technology." She offers her book as a "reminder of the very real material considerations that lie behind [the Internet]" (p. 5). Secondly, Abbate criticizes the current state of historical writing about computer-related technology, claiming that the majority of existing literature has "focused on hardware, on the achievement of individuals, or on the strategies of commercial firms or other institutions" (p. 4). She claims that "relatively few authors have looked at the social shaping of computer communications" (p. 4) and states in the book's introduction that her book is intended to fill this gap in the historical field, crossing the divide "between narratives of production and narratives of use" (p. 4).

Through her attempt to accomplish these two goals, Abbate seeks to counter what she views as a number of commonly held assumptions about the nature of the Internet. She challenges the notion that the Internet was an overnight phenomenon by tracing the historical development of the technologies underlying our concept of this phenomenon. She argues against the unquestioning acceptance of the Internet as an inherently American innovation, seeking instead to provide an account of the specific social and institutional framework that allowed it to develop in the United States. She also seeks to outline the parallel development of network technologies in other countries, illustrating the international contribution to the Internet. Abbate counters the technologically deterministic view that the Internet was destined to become a medium for mass communications, stressing the original military and computer-to-computer communication intentions of the technology while also describing the importance of unanticipated social forces in shaping its current use.

Abbate begins her historical narrative in the Cold War environment of the 1960s with an account of the parallel American and British development of "packet switching" technologies. She positions packet switching (a method of breaking messages into packets of uniform size which may take different transfer routes and be reassembled at their final destination) as the technological origin of the Internet and moves forward from this point. Subsequent chapters examine, among other things, the emergence of the U.S. Military-funded ARPANET project, the struggle of early users to produce practical applications for the network, and the political battle over establishing universal standards for network communications protocol.

Abbate achieves a significant measure of success in her first overriding goal of lending a material presence to the somewhat mythical nature of the Internet's development. Her background as a computer programmer in the 1980s serves her well in this respect, as she comfortably navigates the world of nodes, network protocols, and domain names. By providing a chronological line of technological development, Abbate successfully debunks the myth that the Internet is a recent creation and an "overnight sensation" (p. 181). Her account highlights the fact that the Internet's current "mass appeal" as a means of communication "had no part in the decisions made in [its formation]" (p. 145) as a military technology. The knowledge that our means of communication are far from rigid in their structure, historical development, and function encourages us to question our current assumptions about these media. Abbate's analysis suggests the possibility of reshaping the

form and function of current technologies of communication according to socially defined requirements.

Abbate's success in implementing her second strategy of providing an account of the social construction of the Internet fluctuates throughout the course of her historical narrative. The opening chapter of the book is most satisfying in this regard. Abbate positions the USSR's launching of the Sputnik satellite in 1957 and the ensuing cold war frenzy over the race for communications technologies as the backdrop to her historical account. In this opening chapter, Abbate succeeds in conveying not only the military imperative behind the construction of a rugged communications network that would unite an increasingly important computer-based information system, but also the cultural milieu of the time in which the military's initiative was reflected in a civilian nuclear malaise. It is out of this culture of feared first strikes that the need for "survivable" communications was born. Abbate goes on to identify Paul Baran's concept of packet switching as the technological seed on which the Internet is founded.

However, Abbate's narrative begins to resemble the computer histories she criticizes in her introduction, focusing on hardware developments, individual achievements, and the impact of institutions. The social and cultural circumstances which were effectively presented in the book's opening chapter begin to fade into the background as the book proceeds. Government-sponsored organizations with a dizzying array of acronyms (ARPA, IPTO, NWG, etc.) become the protagonists of Abbate's history. Developments in network protocol, Ethernet cabling, and virtual circuits are unflinching described in minute technical detail, while significant developments that helped transform the technology into a popular medium for mass communications are given short shrift. The "unplanned, unanticipated, and almost unsupported" (p. 109) development of e-mail, which Abbate admits "opened the network up to non-techies" (p. 110), and the emergence of popular and inexpensive network applications such as USENET and BITNET are certainly identified by Abbate, but their profound impact on shaping the Internet into a medium for mass communications is hardly discussed. Incredibly, the development of hypertext and the World Wide Web, without which most of us "non-techies" would probably not have been introduced to the Internet, enters Abbate's narrative only within the last few pages and with very little discussion of their social and cultural impact.

Where Abbate's narrative falls short most often is in discussing the cultural implications of the ideas it addresses. While her historical account asks us to ponder issues of ownership and control of communications technologies, these topics receive only cursory mention. While Abbate identifies the political, cultural, and social framework within which the Internet emerged, she seems reluctant to suggest what implications these historical roots have on its current development. Women, for example, are entirely excluded from her discussion. It seems unfortunate that Abbate, as one of the relatively few women who was involved in the early years of the computer industry (and as someone who, according to her Web site, is currently conducting studies of gender and technology) fails to make any mention of the many issues surrounding women's relationship with Internet technology.

This exclusion of women from her historical account is symptomatic of the overall flaw of Abbate's narrative. While she faithfully outlines the culture from which the Internet emerged, she omits addressing what this origin implies. The problems of "linguistic imperialism" (p. 212) in relation to the overwhelmingly English-language content on the Internet is mentioned by Abbate, but only in passing. She raises, but does not explore, the issue of restricted access to a supposedly international network of communications in a world where Western industrialized countries have a disproportionate share of the world's telephones. Abbate's historical study positions the exploration of "the most important social and cultural factors shaping the Internet" (p. 5) as one of its main academic strate-

gies, yet largely fails to engage some of the most pressing social issues introduced by this technology.

In reading *Inventing the Internet*, one cannot help but feel that Abbate's position as someone who—at least at one time—belonged to the culture of those “in the technical know” has adversely affected her ability to bridge the gap between the material and social history of the Internet. Throughout her text, and despite her claims to the contrary, she writes as if she were someone who is more concerned with technologies than with the “ordinary people” who use them. This position is made most glaring by the fact that it severely damages one of her central claims, namely, that the social force of ordinary peoples' desire to communicate had a major contribution to altering the intended course of network technologies. She does make passing mention of early cases of the “unauthorized [use]” of network technologies, but fails to discuss how these “unauthorized” communication uses helped form the Internet.

By writing *Inventing the Internet*, Janet Abbate engages in the sizable undertaking of constructing both a material and cultural history of a continually evolving communications technology. She certainly succeeds in bringing to light the technological history that is sometimes forgotten in discussions of dematerialized communications media. This material history encourages us to contemplate the social and cultural significance of the current face of the Internet. Who was included in its creation? What interests are being served by its current form and function? Who is being left out of this new communications medium? It is at this point that Abbate's text leaves us seeking answers. Her attempt to determine social constructions of the Internet relies too often on a discussion of the mechanics of technology and government institutions rather than the culture and social impact of ordinary people. Ultimately, Abbate leaves us searching for what she calls “the deeper meaning beneath the nuts and bolts” (p. 179).

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