

MIT OpenCourseWare  
<http://ocw.mit.edu>

STS.036 Technology and Nature in American History  
Spring 2008

For information about citing these materials or our Terms of Use, visit: <http://ocw.mit.edu/terms>.

Sample response to “What is Technology?” readings by Jamie Pietruska, HASTS

In my first semester at MIT, I took a class titled “Technology in the Civil War Era.” When I told a friend what I was taking, she looked at me strangely and said, “I didn’t know they had technology in the Civil War!” As I started to rattle off examples of material technologies used during the Civil War—rifles, cannons, bullets, wagons, the telegraph, and so on—she interrupted and said, “Well, that’s not really *technology*, is it?” Her question sounds simple, but as this week’s readings suggest, the answer is anything but. To my friend, and surely to many others, technology means *something* (definitely a material artifact) very late-twentieth-century and very digital, like a Dell laptop computer, Internet Explorer, a Motorola cellphone, or the ubiquitous iPod. To this week’s essayists, technology is much more than a material object; it is an idea with a history of its own, a political constraint, and a social phenomenon.

We often think of technologies as having the power to change and shape our world, but Leo Marx’s essay underscores the power of *technology* as an *idea*. After he traces the intellectual history of the concept, Marx concludes that the very abstractness of the word *technology* has yielded an unintended consequence for those of us in the late twentieth century: as we have turned *technology* from a concrete noun to an increasingly abstract adjective in our so-called “technological world” or “technological society,” we have given the concept “a host of metaphysical properties and potencies, thereby making it seem to be a determinate entity, a disembodied autonomous causal agent of social change—of history” (5). According to Marx, this mysterious power that our language has ascribed to technology has resulted in “postmodern pessimism” (5). It strikes me as somewhat ironic that the optimism of an increasingly powerful and all-encompassing definition of technology may have resulted in a profound pessimism. Historians often point out that material technologies have unintended consequences in the

physical world, but according to Marx's argument, it seems that the unintended consequences are cultural or metaphysical as well. I wonder how the nineteenth-century belief in a linear march of progress that celebrated railroads and telegraphs, for example, as agents of economic power turned into a late-twentieth-century critique of a far more vague concept of technology as the root of social problems. What kind of pessimism have we ended up with, and where did it come from?

Langdon Winner's discussion of the social and political power of technologies—in particular his account of Robert Moses's low-hanging and thus discriminatory overpasses in New York—suggests one reason for pessimism: a sense of individual powerlessness within the political and social structures established by different technologies (12-13). Winner is careful to say that few technological power structures are the direct result of willful conspiracies against particular social groups (10-11), but his accounts of campus architecture and California tomato harvesting present a fairly bleak picture in which individual students and individual agricultural workers cannot possibly hope to overcome the constraints imposed upon them by designers of concrete campus plazas and the mechanical tomato harvester. Given Winner's account, what kind of optimism can a single person hope for in a society that seems already politically and technologically determined?

Donald MacKenzie's essay offers a partial solution to the pessimism resulting from an increasingly abstract and politicized definition of technology. He reminds us that technologies take on different meanings and have different effects depending on who is using them and why, and so we must see technical decisions as choices made in a particular time and place, not inevitabilities of some natural evolution of "technological progress." We can use Winner's question "Best for whom?" to understand technological change in a more complicated way. To

take one example, we can point to the nineteenth-century advent of clock time as a marvelous innovation that allowed railroads to run according to schedule and carry freight and passengers through space at unheard-of speeds. But a technology that was best for railroad companies and their clients in the mid-nineteenth-century was hardly best for industrial factory workers in cities after the Civil War. In such places, foremen used the clock to control the pace and rhythms of work on the shop floor, thereby taking away the control workers once had over their own labor. MacKenzie's essay suggests that the real significance of technology is not as an abstract concept but rather in the multiple technologies that exist for each social group of users in daily life. MacKenzie's users have power in the choices that they make about supercomputers and microchip density, for example, and thus his view of technology strikes me as more socially constructed than politically determined (and far more optimistic than Winner's). It seems that we can make choices about technology, according to MacKenzie, and that those choices do matter in the long run.

So as I think about the various rationales for a kind of technological optimism and pessimism, I am still left with a big question about the values we attach to the concept of technology. It is easy to see that technology is more than piles of nuts and bolts and wires, just as it is more than an intellectual construct handed down from Enlightenment thought. But it is hard to see exactly what it is in terms of human values, ethics, and morality. Historian of technology Melvin Kranzberg famously said that "technology is neither good nor bad, nor is it neutral." What, then, is technology, and how are we to make sense of Kranzberg's paradoxical law? What might it mean to substitute the word "humans" for "technology" in Kranzberg's sentence? How do we understand our own responsibilities and obligations when we make decisions about new technologies?