Book Review

Are We Thinking About Technology?

Pitt, J. C. (2000). *Thinking About Technology: Foundations of the Philosophy of Technology*. Seven Bridges Press, New York. $22.75 (paperback), 138 pp. (ISBN 1-889119-12-1).

Reviewed by Robert C. Wicklein, Claude D. Hames, and Kenneth Rufo

As the title, *Thinking about Technology,* implies, Joseph Pitt encourages his reader to think about technology, albeit in nontraditional ways. He suggests rethinking and redefining several key concepts: the definition of technology, the epistemological basis for evaluating technology and science, and the relationships between technology and science. Pitt argues persuasively for debunking the myth of technology as the handmaiden of science and insists instead that we understand scientific change in the context of its technological infrastructure.

All experienced educators are aware of both the prevalence and the effects of flawed reasoning and flawed epistemology in the thinking of our students. Despite our best efforts to explain a concept fully, each student interprets and reinterprets and remembers (or does not) every fact and nexus of facts in a peculiarly personal way. Additionally, students form their personal knowledge within the context of social constructs. When the epistemology behind these social constructs is flawed we are left with, at best, benign misunderstanding, and at worst, catastrophic consequences. Examples include a flat earth, disease caused by "bad air" or too much blood, a geocentric universe, a space shuttle program with an unacceptably low chance of surviving liftoff, and, Pitt would argue, the belief in a technology with a life of its own, that can manipulate us against our will or even our awareness. Particularly interesting are Pitt's responses to social critics' claims that "technology is taking over our lives."

In the preface, Pitt outlines his straightforward plan of presentation (p. xii - xiii). He develops a framework for examining issues about specific technologies. He compares concepts developed by philosophers of science with counterpart concepts relating to technology and shows that we might want to rethink how closely we link science with technology. Pitt then attacks assumptions about technology is not an autonomous "thing" that can take over our lives. He concludes the book with a discussion of how technological change differs froscientific change.

Robert Wicklein (wickone@.uga.edu) is an Associate Professor in the Department of Occupational Studies at The University of Georgia in Athens, Georgia. Claude Hames is a technology teacher at Social Circle High School in Social Circle, Georgia and a doctoral degree candidate in the Department of Occupational Studies at The University of Georgia. Kenneth Rufo is a doctoral degree candidate in the Department of Speech Communication at The University of Georgia.

Pitt begins his search for definition with a simple example most will remember from middle school, the distinction between "pure" and "applied" research. This distinction, he argues, leaves the impression that applied is somehow inferior to the pure, and by implication, that technology (applied) is somehow inferior to science (pure). Pitt then proceeds to examine the claims of how we know facts of science and shows that often we produce workable (and even excellent) technology using a scientific theory we later learn to be false (e.g., Galileo's telescope worked for reasons he did not understand). Pitt reasons that the relationships between science and technology are much more complicated than the simple pure/applied distinctions would allow. In short, he sees technology and science as mutually symbiotic, with science being a (rather specialized) subset of technology instead of technology being "the handmaiden of science."

Pitt's definition of technology, "*Humanity at Work*," is arguably more broad than those definitions which focus on tools or artifacts. He draws a distinction between tools *per se* and the use of those tools. Technology is the *use* of tools, Pitt insists, *not* the tools themselves. This definition at the least promises to clarify the problem of a common confusion known only too well to Technology Education professionals, "Oh, you're the ones who teach computers?"

If we accept Pitt's definition of science, that is, science in the modern sense (complete with hypotheses, controls, etc.), then, as he notes, technology is epistemologically prior to science (p. 24). Indeed, humans engineered, manufactured, and produced goods and structures for millennia before we developed and canonized the cardinal points of what a modern scientific experiment might look like. Pitt compares and contrasts the concepts of scientific knowledge vs. technological (engineering) knowledge, scientific explanation vs. technological explanation (with a particularly instructive example from the initial failure of the Hubble space telescope).

Pitt shows, with examples from Heidegger's philosophical musings and Langdon Winner's social criticism (from Winner's book, *The Whale and the Reactor*), how ideology informs our epistemology of technology. If we approach technology with value-laden, polemical assumptions (in the case of Winner's concerns), or with tautological jargon (Heidegger) "…we bypass the *epistemological* questions associated with inquiries into technology." (p. 83). We imbue technology with a mysticism that resists empirical investigation and invites acceptance or rejection on the basis of ideological bias. Pitt claims that cognitive values are often overlooked when technology is seen only in ideological terms. He argues instead for an investigation of the tools and techniques (technology) based on the actions of the humans who use them. He even suggests that one of the reasons for the mysticism is to allow humans to escape the responsibility of their actions.

Arguably, one of Pitt's most cogent contributions in this book may well be his efforts to refute the concept of autonomous technology and its alleged negative influence on individuals and society. In Chapter 6, he debates Jacques Ellul's claim that technology *is* autonomous with respect to economics and politics. Ellul, and other writers, present technology as an autonomous thing,

controlling and manipulating us apart from our own will and even our awareness. Technology, for these writers, is a thing to be feared, or at least to be watched with a critical eye. Pitt discusses what he calls trivial autonomy, for example, the claim that an invention can outgrow the intent and control of its inventor and that the inventor could not have foreseen the consequences of an invention. Once the invention is in the public domain, Pitt argues, the technology doesn't become autonomous. It is being used, converted, improved, etc. by other *humans*. It is not, therefore, autonomous. To quote Pitt, "…the long and the short of it is that those who fear reified technology really fear men. It is not the machine that is frightening, but what some will do with the machine…" (p. 99). In Chapter 7, Pitt expands this reasoning to argue that technology does not exercise autonomy over democracy or society. The difficulties that arise from Pitt's extremely strict understanding of autonomy ("freedom from influence in development and use") would relegate no thing and no one from any independent action or thought. Life is nothing if not influence and being influenced. Politics, religion, and language – these forces permeate who we are just as they permeate objects we create. Pitt's understanding of autonomy is, in our opinion, bankrupt of any utility and as a consequence incorrect on the impact that technology is having on society.

A few examples from everyday American society should suffice to prove that technology is autonomous. The nuclear weapon, that mainstay of American power projection, certainly creates its own order. The presence of a nuclear weapon continues to exert influence, to create structure, long after its creators brought it into being. The creators don't instill fear, their creation does. The automobile creates its own system of disorder as well, spewing out airborne toxins and changing the nature of social organization. The designers of the automobile did not create the roads and sprawl; these things are caused by the nature of the car itself. These kinds of technologies can rightly be called autonomous.

Have humans lost control of their creations? Perhaps we have embarked upon the road forecast by the Terminator movies. Perhaps not. Nevertheless, our creations are already coming back to destroy us, albeit with less dramatic means. The weapons of choice include accidents like Chernobyl and environmental disasters like global warming. Pitt believes we can just gather our collective will together to stop these technologies from harming us. Pitt is wrong. Many technologies have such large lag-times between their use and their effect that they may be stopped or changed too late to avoid the eventual negative consequences. Other technologies, like the Three Gorges Dam or oil exploration in the Artic Wildlife Preserve, are irreversible. That is by definition, autonomous.

Pitt concludes with an engaging discussion of the interrelationships (with emphasis on the plural) between science and the technological infrastructure within which science and technology are mutually nurtured. For the student of technology, science, or philosophy, this chapter alone is worth the cost of the book. In today's often fragmented educational setting, where information is presented and learned in seemingly unrelated chunks, Joseph Pitt offers a

refreshing and compelling case for synthesis and symbiosis in *Thinking About Technology*. Get the book, read it slowly with much thought and you will understand how the concepts and issues are applicable and needed to the study of technology in our schools and universities. Think about technology!