

Deborah G. Johnson and Jameson M. Wetmore, eds:
Technology and Society: Building Our Sociotechnical Future.
The MIT Press: Cambridge, Massachusetts, and London, England, 2009.
623 pages.

Technology and Society is a STS anthology edited by two US-based scholars Deborah G. Johnson and Jameson M. Wetmore. The book is structured into five thematic parts that comprise 34 classic or otherwise noteworthy articles from different time periods accompanied by editors' introductions. Primarily, the book is intended for educational use in STS and beyond.

STS is a continuously evolving field. From the origins that can be traced back to the environmentalist manifesto of Rachel Carson's *Silent Spring* (1962) and the programmatic reinterpretation of the history of science in Thomas Kuhn's *The Structure of Scientific Revolutions* (1962), STS has lived with a tension between activist and academic trajectories. The so-called split between STS as "science, technology, and society" versus STS as "science and technology studies" is nevertheless undergoing a contemporary reintegration through a concern for policy, as is witnessed to some degree by the volume under review. Even though "policy" does not figure prominently in the book, many contributors nevertheless express interests in technoscientific policy making. Indeed, in its concern for the future, the book as a whole clearly implicates policy—"policy" being understood as decision making informed by or informing science, with "science" understood broadly as including technology.

This collection of readings includes work by STS scholars as well as engineers, scientists, philosophers, social scientists, and social activists providing conceptual tools, case studies, and theories for thinking about the relationships between science, technology, society, and values. But the collection aspires to go beyond simply thinking. As the editors write in their introduction, "While this book provides an understanding of the relationship between technology and society, the ultimate intent is not simply to inform, but to challenge readers and equip them to be agents of change in our sociotechnical future". This could be interpreted as editors' aspiration to reinforce a policy element in STS discourse.

Part one opens with six "visions of a technological future." These contributions indicate that it is difficult to distinguish clearly positive and negative impacts. All that can be known for sure is that whatever technologies we use today will help shape the future. According to physicist Freeman Dyson, social justice can be promoted by technological advance in the context of a global economy. By contrast, novelist E.M. Forster's classic short story "The Machine Stops" presents a dystopian future transformed by technology. According to political philosopher Francis Fukuyama technological prolongation of the human life span will

have profound social and psychological implications for what it means to be human. Nordic STS scholar Stellan Welin analyzes the social, political, and ethical challenges that will accompany success in xenotransplantation. Finally, the report by the United States Interagency Working Group on Nanoscience, Engineering, and Technology that influenced creation of the U.S. National Nanotechnology Initiative is paired with computer scientist Bill Joy's warnings about the danger that converging genetics, nanotechnology, and robotics may produce a humanless world.

Part two turns from visions to alternative understandings of the technology-society interaction. Although technology plays a pivotal role in shaping society, this does not mean that the future is technologically determined. Economic historian Robert Heilbroner thus begins by rejecting any simple sense in which "machines make history." The other five articles draw on approaches that emphasize the social construction of technology by individuals and social groups such as engineers, lawyers, and politicians along with social institutions such as corporations and governments. STS scholars Trevor Pinch and Wiebe Bijker argue for the "social construction of facts and artifacts" in a case study of the evolution of the bicycle that develops the concept of "interpretive flexibility" as an approach to analyzing technological change. Historian of technology Thomas Hughes explores the "technological momentum" often present in sociotechnical systems. In his classic article "Where are the missing Masses?", Bruno Latour maintains that both humans and nonhumans can contribute to actor networks. Legal theorist Lawrence Lessig presents computer code as an internet actor. Gender studies scholar Patrick

Hopkins argues for the inclusion of gender as relevant to technology-society transformations.

Extending the analysis of technology-society interactions, part three considers how values can influence technology. Here political scientist Langdon Winner argues in his well-known article "Do artifacts have politics" that artifacts can manifest political values in intentional but hidden forms as well as unintentional overt ways. Sociologist George Ritzer sees "McDonaldization" as a value-laden use of technology to control products and people. Film studies scholar Richard Dyer points out how photography and film technology has historically devalued darker skinned peoples. Urban planning scholar Rachel Weber describes how military cockpit design assumes and reinforces male value assumptions about pilot body norms. Science policy critic Daniel Sarewitz questions the ability of the marketplace, as "the principle venue through which the products of science and technology pass into society", to promote quality of life rather than simple economic values. STS scholar Jameson Wetmore explores how the alternative values of Amish communities have structured technologies in ways quite different from those of mainstream American society.

Part four focuses on the "complex nature of sociotechnical systems" using a variety of specific technologies—analysed mainly by STS scholars—for illustration. Patrick McCray and Dominique Vinck in separate articles describe a variety of factors that can affect the multiple aspects of sociotechnical systems development. The incomplete understanding of technological designs leads to another kind of complexity, as elaborated in two articles by co-authors Harry Collins and Trevor Pinch—one

dealing with the catastrophic failure of the space shuttle *Challenger*, another with the ambivalences of crash testing nuclear fuel flasks and kerosene tanks. Carne Alemany Gomez examines the simple home washing machine as one element in a complex sociotechnical system that implicates gender. Neil Pollock observes how users do not necessarily follow the intentions of technological designers, but can easily reinterpret a technology and thereby alter the use, meaning, or endurance of a sociotechnical system.

Finally, part five considers ten “twenty-first-century challenges” for building a better sociotechnical world. Because new technologies will be implicated in all aspects of our sociotechnical future, it is not enough simply to identify alternative visions, analyze path dependency, technological momentum, and the influence of values in complex sociotechnical systems. At some point, there is a need for reflecting critically on what kind of future is desirable. Such normative reflections range here over tensions between technological and social imperatives, feminism, relations between emerging technologies such as nanotechnology and equity in global development, technology and protest politics, security and surveillance, energy, environmental justice, and human enhancement via biotechnology. The 16 authors of the ten concluding contributions reiterate the necessarily interdisciplinary character of STS thought and practice while sketching a spectrum of challenges that should give STS scholars and activists pause for thought.

What nevertheless remains missing—and is especially obvious in a volume that calls attention to the multiple contexts of technoscience—is use of historical and contemporary resources available

in pragmatist philosophy. For instance, it is known that pragmatist philosopher John Dewey rejected the linear model of the science-society relationship a long time ago. One could argue that adding pragmatist analyses of the interactions of vision, technology-society relations, values, and sociotechnical systems could not help but promote a policy-oriented interest in bridging of the activist and academic divides in STS noticeable in the wide-range of readings collected in this volume.

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