

Science and Technology Studies

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Science and Technology Studies (STS) is a relatively new academic field. Its roots lie in the interwar period and continue into the start of the Cold War, when historians and sociologists of science, and scientists themselves, became interested in the relationship between scientific knowledge, technological systems, and society. The best known product of this interest was Thomas Kuhn's classic 1962 study, *The Structure of Scientific Revolutions*. This influential work helped crystallize a new approach to historical and social studies of science, in which scientific facts were seen as products of scientists' socially conditioned investigations rather than as objective representations of nature. Among the many ramifications of Kuhn's work was a systematic effort by social scientists to probe how scientific discovery and its technological applications link up with other social developments, in law, politics, public policy, ethics, and culture.

STS, as practiced in academia today, merges two broad streams of scholarship. The first consists of research on the nature and practices of science and technology (S&T). Studies in this genre approach S&T as social institutions possessing distinctive structures, commitments, practices, and discourses that vary across cultures and change over time. This line of work addresses questions like the following: is there a scientific method; what makes scientific facts credible; how do new disciplines emerge; and how does science relate to religion? The second stream concerns itself more with the impacts and control of science and technology, with particular focus on the risks that S&T may pose to peace, security, community, democracy, environmental sustainability, and human values. Driving this body of research are questions like the following: how should states set priorities for research funding; who should participate, and how, in technological decisionmaking; should life forms be patented; how should societies measure risks and set safety standards; and how should experts communicate the reasons for their judgments to the public?

The rise of STS as a teaching field reflects a dawning recognition that specialization in today's research universities does not fully prepare future citizens to respond knowledgeably and reflectively to the most important challenges of the contemporary world. Increasingly, the dilemmas that confront people, whether in government, industry, politics or daily life, cut across the conventional lines of academic training and thought. STS seeks to overcome the divisions, particularly between the two cultures of humanities (interpretive inquiry) and natural sciences (rational analysis).

STS teaching seeks to promote cross-disciplinary integration, civic engagement, and critical thinking. Undergraduate STS courses are especially popular with engineering and pre-professional students, including premeds. They help to illuminate issues of professional responsibility and ethics. Such courses also build bridges between disciplines that do not ordinarily meet each other in the undergraduate curriculum, such as sociology and science, law and science, anthropology and technology, environmental science and political theory, or technology and philosophy. Graduate STS courses offer ways of integrating knowledge in areas that are impossible to grasp through any single discipline; examples include security studies,

environmental studies, globalization, the human sciences, and biology and society. STS courses in these areas enable students to form more robust understandings of the nature of controversy, the causes of scientific and technological change, the relationship of culture and reason, and the limits of rational analytic methods in characterizing complex problems.

In sum, STS explores in rich and compelling ways what difference it makes to human societies that we, collectively, are producers and users of science and technology. STS research, teaching, and outreach offer citizens of modern, high-tech societies the resources with which to evaluate—analytically, esthetically, and ethically—the benefits and the risks, the perils and the promises, of notable advances in science and technology.

Additional Readings

- Mario Biagioli, ed., *The Science Studies Reader* (Routledge, 1999).
- Wiebe Bijker, Thomas P. Hughes, and Trevor Pinch, eds., *The Social Construction of Technological Systems* (MIT Press, 1987).
- David J. Hess, *Science Studies: An Advanced Introduction* (New York University Press, 1997).
- Sheila Jasanoff, Gerald Markle, James Petersen and Trevor Pinch, eds., *Handbook of Science and Technology Studies* (Sage Publications, 1995).
- Bruno Latour, *Reassembling the Social: An Introduction to Actor-Network Theory* (Oxford University Press, 2005).
- Sergio Sismondo, *An Introduction to Science and Technology Studies* (Blackwell, 2003).