

SYLLABUS

History of Science 907, Spring 2013
Historiography of Technology
3:30-6:00 Wednesday, 204 Bradley Memorial

Professor: Eric Schatzberg Office: 224 Bradley Memorial	Office Hrs: 1:00-2:30 Monday or by appt. Telephone: 262-3973 Email: eschatzb@wisc.edu
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Description:

This graduate seminar provides an intensive survey of the methodological and theoretical issues that have shaped scholarly work in the history of technology. Readings will range from classic works, like Lewis Mumford's 1934 *Technics and Civilization*, to recent books and articles. The first part of the course is organized chronologically, following the origins of history of technology and the development of major approaches in the field. In the second part of the course, we will focus on recent monographs that exemplify new historiographic directions.

Requirements:

- Each member of the seminar is expected to do the reading with sufficient care to participate intelligently in each week's discussion
- Seminar members will write a 15-25 page paper on a topic related to the historiography of technology. In general, this paper will be a historiographic essay, called in some fields a literature survey. This type of paper provides a critical evaluation of a body of secondary literature related to a particular topic, taking account of various controversies and interpretations, and how these have changed over time.

Email Class List:

The email list for this course is histsci907-1-s13@lists.wisc.edu. **PLEASE** put HS907 at the start of the subject line when you send email to the list. We will use the email to share thoughts about the course and to distribute additional materials.

Grades

Grading in this graduate seminar reflects my subjective judgment about the quality of your work and your scholarly potential. I value creative insight, independent thinking, thoughtful analysis of the readings, evidence of thorough preparation, clear prose, and regular participation in discussions.

Course Books and Other Readings:

I have not ordered books for this course. You may place your own orders on-line, or the class can place an order collectively. Here is the list of required books. Note that the Hughes book is available online through the UW Library, and that we are not reading all of Hughes and Latour.

- Lewis Mumford, *Technics and Civilization* (New York: Harcourt Brace Jovanovitch, 1934)
- Thomas P. Hughes, *Networks of Power: Electrification in Western Society, 1880-1930* (Baltimore: Johns Hopkins University Press, 1983)
- Bruno Latour, *Science in Action* (Cambridge: Harvard University Press, 1987)
- Nathan Ensmenger, *The Computer Boys Take Over: Computers, Programmers, and the Politics of Technical Expertise* (Cambridge: MIT Press, 2010)
- David A. Mindell, *Digital Apollo: Human and Machine In Spaceflight* (Cambridge: MIT Press, 2008).
- Kevin L. Borg, *Auto Mechanics: Technology and Expertise in Twentieth-Century America* (Baltimore: Johns Hopkins University Press, 2007)
- Deborah Fitzgerald, *Every Farm a Factory: The Industrial Ideal in American Agriculture* (New Haven: Yale University Press, 2003)
- Michele Murphy, *Sick Building Syndrome and the Problem of Uncertainty: Environmental Politics, Technoscience, and Women Workers* (Durham: Duke University Press, 2006)
- Michael Bess, *The Light-Green Society: Ecology and Technological Modernity in France, 1960-2000* (Chicago: University of Chicago Press, 2003)
- Eden Medina, *Cybernetic Revolutionaries: Technology and Politics in Allende's Chile* (Cambridge: MIT Press, 2011)

Most other readings are available online through the UW-Madison libraries. Additional materials will be made available through Learn@UW.

All readings will be also be on reserve at College Library.

Religious Holidays and ADA Notice:

You can take off any religious holidays you want, as long as you make up the work.

If you have a disability that might adversely affect your performance in this course, let me know and I'll do my best to accommodate you. For more information, contact the McBurney Disability Resource Center, 263-2741.

Freaking Out:

Graduate students are often under a tremendous amount of stress. If you feel like things are getting a bit too weird, either for personal or academic reasons, do not hesitate to let me know. More help is available from the Counseling and Consultation Service, part of the University Health Service, 333 East Campus Mall, 265-5600. For more information, see <http://www.uhs.wisc.edu/services/counseling/>.

COURSE OUTLINE

Week 1 (1/23): Introduction – A Quick Historiographic Survey

This speech by a leading historian of communications technology provides a nice overview of the historiography of technology in the last 30 years or so.

Reading: Douglas, Susan J. "Some Thoughts on the Question "How Do New Things Happen?"" *Technology and Culture* 51, no. 2 (2010): 293-304, available from <http://muse.jhu.edu/journals/tech/summary/v051/51.2.douglas.html>

Please complete this reading for the first meeting of the seminar.

Supplemental reading: Eric Schatzberg, "Technik Comes to America: Changing Meanings of Technology Before 1930," *Technology and Culture* 47 (July 2006): 486-512; Ruth Oldenziel, "Signifying Semantics for History of Technology," *Technology and Culture* 47 (July 2006): 477-85; Leo Marx, "Technology: The Emergence of a Hazardous Concept," *Technology and Culture* 51, no. 3 (2010): 561-577.

Part 1 - From Mumford to Social Construction: A Chronological Survey

Week 2 (1/30): Classic Grand Narratives

In 1934, Lewis Mumford published the first historically sophisticated grand narrative of the development of technology in the West. His analysis in this book contains the germ of almost every major theme in the subsequent historiography of technology, though in other ways the work is deeply flawed.

Reading: Lewis Mumford, *Technics and Civilization* (New York: Harcourt Brace Jovanovitch, 1934). Read entire book, but go quickly over the last three chapters (5-7); Rosalind H. Williams, "Lewis Mumford's Technics and Civilization (Classics Revisited)," *Technology and Culture* 43 (2002): 139-149.

Supplemental reading: Siegfried Giedion, *Mechanization Takes Command: A Contribution to Anonymous History* (Oxford: Oxford University Press, 1948); Abbot Payson Usher, *A History of Mechanical Inventions*, rev. ed. (Boston: Beacon Press, 1954); Arthur P. Molella, "Mumford in Historiographical Context," in *Lewis Mumford: Public Intellectual*, ed. Thomas P. Hughes and Agatha C. Hughes (New York: Oxford University Press, 1990), 21-42; Rosalind Williams, "Lewis Mumford as a Historian of Technology in *Technics and Civilization*," *ibid.*, 43-65.

Week 3 (2/6): Historiographic Anxiety: SHOT's Early Years

The Society for the History of Technology was founded in 1958; its journal, *Technology and Culture*, began publishing late the following year. The society and its journal provided the first forums in the United States for serious scholarship in the history of technology. We will read a selection of historiographic articles from T&C.

Reading: Melvin Kranzberg, "At the Start," *Technology and Culture* 1 (1959): 1-10; Peter F. Drucker, "Work and Tools," *Technology and Culture* 1 (1959): 28-37; George H. Daniels,

"The Big Questions in the History of American Technology," *Technology and Culture* 11 (1970): 1-21; Landgon Winner, "Do Artifacts Have Politics," *Daedalus* 109 (Winter 1980): 121-136.

Supplemental reading: For general historiography of SHOT, see John Staudenmaier, *Technology's Storytellers: Reweaving the Human Fabric* (Cambridge: MIT, 1985); Staudenmaier, "Rationality, Agency, Contingency: Recent Trends in the History of Technology," *Reviews in American History* 30 (2002): 168-81. See also Eugene S. Ferguson, "Toward a Discipline of the History of Technology," *Technology and Culture* 15 (1974): 13-30; Bruce E. Seely, "SHOT, the History of Technology and Engineering Education," *Technology and Culture* 36, no. 4 (1995): 739-772.

Week 4 (2/13): Thomas Hughes and Technological Systems

One of the major historiographic innovations of the early 1980s was the technological systems approach associated with Thomas P. Hughes. We'll read a large part of the classic work that established this approach, as well as an earlier historiographic article.

Reading: Thomas P. Hughes, "The Order of the Technological World," *History of Technology* 5 (1980): 1-16; Hughes, *Networks of Power: Electrification in Western Society, 1880-1930* (Baltimore: Johns Hopkins University Press, 1983), 1-174, 461-465 (chaps. 1-6, 15), skim remainder.

Week 5 (2/20): Sociology of Scientific Knowledge (SSK)

SSK was an approach to understanding science that emerged in the late 1970s, in many ways crystallizing years of debates sparked by Thomas Kuhn's *Structure of Scientific Revolutions*. Some background in this approach is essential for understanding the emergence of the SCOT approach, which we'll examine next week.

Readings: David Bloor, *Knowledge and Social Imagery*, 2nd ed. (Chicago: University of Chicago Press, 1991 [1976]), 1-83; Steven Shapin, "Here and Everywhere: Sociology of Scientific Knowledge," *Annual Review of Sociology* 21 (1995): 289-321.

Week 6 (2/27): History of Technology Meets SSK

In the 1980s, scholars began to apply to technology new approaches drawn from the sociology of science. One approach was the social construction of technology (SCOT), a fairly direct application of ideas from sociology of scientific knowledge (SSK).

Reading: Trevor J. Pinch and Wiebe E. Bijker, "The Social Construction of Facts and Artefacts: or How the Sociology of Science and the Sociology of Technology Might Benefit Each Other," *Social Studies of Science* 14 (1984): 399-441; Bijker, "The Social Construction of Bakelite: Toward a Theory of Invention," in Wiebe E. Bijker, Thomas Parke Hughes, and T. J. Pinch, *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology* (Cambridge: MIT Press, 1987), 155-182; Wiebe E. Bijker, "Do Not Despair: There Is Life after Constructivism," *Science, Technology, & Human Values* 18, no. 1 (1993): 113-138.

Supplemental reading: Steve Woolgar, "The Turn to Technology in Social Studies of Science," *Science, Technology and Human Values* 16 (1991): 20-50; Langdon Winner, "Social Constructivism: Opening the Black Box and Finding it Empty," *Science as Culture* 3 (1993): 427-52; Daniel Lee Kleinman, "Untangling Context: Understanding a University Laboratory in the Commercial World," *Science, Technology and Human Values* 23 (1998): 285-314; Ian Hacking, *The Social Construction of What?* (Cambridge: Harvard University Press, 1999).

Week 7 (3/6): Actor-Network Theory: Are They Serious?

The rise of SCOT was paralleled by a related theory with French roots, actor-network theory (ANT). Proponents of ANT, mainly Bruno Latour, Michel Callon, and John Law, promoted their approach as an alternative to SCOT.

Reading: Bruno Latour, *Science in Action* (Cambridge: Harvard University Press, 1987), 1-176; John Law, "Technology and Heterogeneous Engineering: The Case of Portuguese Expansion," in *Social Construction of Technological Systems*, 105-127; David Bloor, "Anti-Latour," *Studies in the History and Philosophy of Science* 30 (1999): 81-112; reply by Latour, *ibid.*, 113-29; response by Bloor, *ibid.*, 131-36.

Part 2 - From Historiography to Historical Practice: Recent Monographs

Week 8 (3/13): From Innovation to Use

In the 1980s, feminist scholarship helped shift scholarly attention from new technologies to the ways that technologies were actually used. David Edgerton is among the strongest proponents of this shift in emphasis. We'll read what amounts to his manifesto on the topic, along with a recent monograph on computer programmers.

Reading: David Edgerton, "From Innovation to Use: Ten (Eclectic) Theses on the History of Technology," *History and Technology* 16 (1999): 1-26; Nathan Ensmenger, *The Computer Boys Take Over: Computers, Programmers, and the Politics of Technical Expertise* (Cambridge: MIT Press, 2010).

Supplemental reading: Nelly Oudshoorn and Trevor Pinch, eds., *How Users Matter: The Co-Construction of Users and Technologies* (Cambridge: MIT Press, 2003); Ronald R. Kline, *Consumers in the Country: Technology and Social Change in Rural America* (Baltimore: Johns Hopkins University Press, 2000); Ruth Schwartz Cowan, "The Consumption Junction: A Proposal for Research Strategies in the Sociology of Technology," in *Social Construction of Technological Systems*, 261-80.

Week 9 (3/20): Human-Machine Interactions

With the shift in attention to use, studies in the technological innovation has become more sophisticated. This week we read another example from computing that focuses on how users interact with technology.

Reading: David A. Mindell, *Digital Apollo: Human and Machine In Spaceflight* (Cambridge: MIT Press, 2008).

Spring Break

Week 10 (4/3): More Technologies in Use - Auto Repair

The shift to studying technologies in use also highlights the human effort required to keep machines working. This monograph examines the creation of an occupation essential to the modern system of automobility, namely auto mechanics.

Reading: Kevin L. Borg, *Auto Mechanics: Technology and Expertise in Twentieth-Century America* (Baltimore: Johns Hopkins University Press, 2007).

Week 11 (4/10): Agriculture as Technology

The world view embodied in large technological systems was not limited to capital-intensive manufacturing. It also spread to other fields, including agriculture. This monograph demonstrates the spread of the factory ideal to farming.

Reading: Deborah Fitzgerald, *Every Farm a Factory: The Industrial Ideal in American Agriculture* (New Haven: Yale University Press, 2003).

Week 12 (4/17): Technology and Gender

Gender has been a secondary issue in several of the readings in this course so far. The first reading for this week provides an overview of the early history of this topic. The monograph for this week integrates gender into a study of architecture, toxicology, and disease.

Reading: Judith A. McGaw, "No Passive Victims, No Separate Spheres: A Feminist Perspective on Technology's History," *In Context: History and the History of Technology: Essays in Honor of Melvin Kranzberg*, ed. Stephen H. Cutcliffe and Robert C. Post (Bethlehem: Lehigh University Press, 1989), 173-191; Michele Murphy, *Sick Building Syndrome and the Problem of Uncertainty: Environmental Politics, Technoscience, and Women Workers* (Durham: Duke University Press, 2006).

Supplemental reading: Nina Lerman, Ruth Oldenziel, and Arwen P. Mohun, eds., *Gender and Technology: A Reader* (Baltimore: Johns Hopkins University Press, 2003); Judy Wajcman, *Feminism Confronts Technology* (University Park: Pennsylvania State University Press, 1991); Ruth Oldenziel, *Making Technology Masculine: Men, Women and Modern Machines in America, 1870-1945* (Amsterdam: Amsterdam University Press, 1999); Virginia Scharff, *Taking the Wheel: Women and the Coming of the Motor Age* (New York: Free Press, 1991).

Week 13 (4/24): Environmental Technopolitics

The intersection of environmental history and history of technology has helped create a new field known as "envirotech." The book assigned for this week fits loosely into that intersection, with a good dose of politics thrown in.

Reading: Michael Bess, *The Light-Green Society: Ecology and Technological Modernity in France, 1960-2000* (Chicago: University of Chicago Press, 2003).

Supplemental readings: Jeffrey K. Stine and Joel A. Tarr, "At the Intersection of Histories: Technology and the Environment," *Technology and Culture* 39 (1998): 601-40; Richard

White, *The Organic Machine: The Remaking of the Columbia River* (Hill & Wang, 1995); Sara B. Pritchard, *Confluence: The Nature of Technology and the Remaking of the Rhône* (Cambridge: Harvard University Press, 2011).

Week 14 (5/1): Technological Alternatives Outside the West

Readings for this course so far have focused almost entirely on Western industrialized countries. The reading for this week focuses on the attempt of a Latin-American country to use technology to break the fetters of neo-colonialism.

Reading: Eden Medina, *Cybernetic Revolutionaries: Technology and Politics in Allende's Chile* (Cambridge: MIT Press, 2011).

Week 15 (5/8): Presentations or Student's Choice

The final week will be devoted to presentations of students' research or to a reading chosen by participants in the seminar.

5/15, 5:00 pm: Final Papers Due

Hand in your papers at my office or email them.

