

STS.001 TECHNOLOGY IN AMERICAN HISTORY

A HASS-CI SUBJECT

Spring 2003

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CLASS OVERVIEW

This course will consider the ways in which technology, broadly defined, has contributed to the building of American society from colonial times to the present. Far from being an "add-on" to political and social events, technology is viewed as a central organizing theme in American history. Indeed, the United States is often referred to in today's popular media as "the technological society." What does that expression mean? Why did it originate? How and in what ways does technology intersect with other strands of American history -- society and politics, for instance? Does technology mean progress? If so, progress for whom and for what? What is the relationship between technology and democracy in America?

This course has three primary goals: to train students to ask critical questions of both technology and the broader American culture of which it is a part; to provide an historical perspective with which to frame and address such questions; and to encourage students to be neither blind critics of new technologies, nor blind advocates for technologies in general, but thoughtful and educated participants in the democratic process.

REQUIREMENTS

This class meets three times a week: on Mondays and Wednesdays there will be a 50-minute lecture or film and a recitation section led by Shane Hamilton. In addition to attending all classes, students are expected to participate in class discussions by reading the assigned materials **before** class and thinking about the themes, questions, and historical patterns the readings suggest.

Writing for this course will consist of a book report (5-6 pages), an assigned essay (11-12 pages), a revision of the assigned essay, and two or three reading response/reflection papers (2-3 pages). There also may be impromptu reading quizzes, depending on how well class discussions go. Specific instructions for these assignments will be forthcoming.

Due dates for the writing assignments are:

Book review: Due March 12

Essay: Due April 14

Revised essay: **Due May 9**

Reading response papers: each student will be assigned two or three dates on which they are expected to submit their response papers. These papers will be used by the instructors to initiate discussion during the recitation sections.

All written work must be typed, double-spaced, with adequate margins. All papers must be proofread (not just spell-checked!) before submission; papers will be downgraded for careless errors. A writing tutor, Jessica Weintraub, has been assigned to this class. Students who need extra help with writing will be notified by Professor Smith or Mr. Hamilton and, of course, can seek out Ms. Weintraub on their own.

There will be a three-hour final examination covering all material from the entire semester. This will occur during final exam week. Keep in mind that the lectures and readings for this course do not usually cover the same material, and lecture notes are not available in the library. This means that **you must take good notes** during the lectures to help you study for the final exam.

In this class, only parts of the lectures will make it onto the blackboard, so plan on taking notes on everything whether it is on the board or not. You might want to find a "lecture note buddy" in case you miss a class. There is no mid-term examination, but unannounced quizzes on the reading assignments and films are always possible.

Final grades will be determined as follows:

Book review: 25%

Essay: 30%

Reflection papers: 20% (includes quizzes, if necessary)

Final examination: 25%

A WORD TO THE WISE

Regular attendance, participation, and a good attitude are essential. Without all three you will not get much out of this course. Attendance will be taken and poor attendance will result in severe final grade penalties. Each student is allowed four (4) cuts. Thereafter one's final grade will be reduced by one full grade per cut.

Readings and Films

The following textbooks are required and may be purchased at the Tech Coop:

Ruth Schwartz Cowan, A Social History of American Technology (New York: Oxford UP, 1997)

Merritt Roe Smith and Gregory Clancey, eds., Major Problems in the History of American Technology (Boston: Houghton Mifflin, 1998)

Films will be deposited at the Reserve desk in the Dewey Social Sciences Library immediately after their showing in class. Students who have missed seeing a film may view it in the Library.

CLASS SCHEDULE

W 5 Feb 2003	<p style="text-align: center;">Introduction</p> <p>Film: "A Man, A Plan, A Canal, Panama"</p>
M 10 Feb	<p>What is technology?</p> <p>Read: Smith and Clancey, <u>Major Problems in the History of American Technology</u>, pp. xiii-xv (preface), 2-15 (Marx, Winner, and MacKenzie essays); Cowan, <u>Social History of American Technology</u>, pp. 1-4, 201-218.</p>
W 12 Feb	<p>Technologies of colonization and conquest</p> <p>Read: Smith & Clancey, pp. 26-60; Cowan, pp. 5-27.</p> <p>Artifacts: homespun cloth, tomahawk</p>
T 18 Feb	<p>Crafts and craftsmanship in early America</p> <p>Read: Cowan, pp. 28-65 (pp. 61-102 are optional).</p> <p>Film: "The Colonial Gunsmith" (Williamsburg)</p>
W 19 Feb	<p>Homespun, guns, and shovels: artifacts from a transitional age</p>

Guest speaker: Dr. Greg Galer (Stonehill College)

Artifact: a piece of homespun woolen cloth, a Kentucky rifle; an Ames shovel

- M 24 Feb **Politics and early American industrialization**
Read: Smith & Clancey, pp. 103-142;
 Cowan, pp. 67-91.
 Lecture: Technology and nationalism, c. 1790s-1800s
- W 26 Feb **Textiles, firearms, and the role of the state in early American industry** (Prof. Smith)
 Lecture: From Swords to Plowshares: the domestication of military technologies prior to the Civil War (Prof. Smith)
 Artifacts: cloth made at Lowell mills; Hall rifle (1826)
- M 3 Mar **Social and political implications of the new technology**
Read: Smith & Clancey, pp. 144-189.
 Lecture: Technology and Politics (Prof. Smith)
- W 5 Mar **The transportation revolution**
Read: Cowan, pp. 93-118;
 Smith & Clancey, pp. 191-221-232.
 Lecture: "System/Order/Uniformity": Army engineers and the rise of modern management (Prof. Smith)
- M 10 Mar **Art and industrialization**
Read: Cowan, pp. 208-218; also read Nathaniel Hawthorne's short story, "The Celestial Railroad" (handout)
 Lecture: The railroad as a technological symbol in American art
- W 12 Mar **The emerging culture of engineering**
Read: Cowan, pp. 119-147;
 M. R. Smith, "Becoming Engineers" (essay handout).
Film: "The Iron Road"
*****BOOK REVIEW DUE (March 12)*****
- M 17 Mar **Technology, Civil War, and the rise of big business**
Read: Cowan, pp. 149-171-199;
 Smith & Clancey, pp. 234-263.
Discussant: Brendan Foley (Dibner Institute, MIT)
- W 19 Mar **Film:** "Brooklyn Bridge"
- 24-27 Mar **SPRING VACATION**

- M 31 Mar **Human Machines? Taylorism**
Film: "Clockwork"
Read: Smith & Clancey, pp. 267-311.
- W 2 Apr **Automobility and mass production**
Read: Cowan, pp. 221-248;
 Smith & Clancey, 313-354.
- M 7 Apr **Autos, trucks, and American culture**
- W 9 Apr **Film:** "Modern Times" (1936, with Charles Chaplin)
- M 14 Apr **Hobbyist worlds and modern America**
Read: Smith & Clancey, pp. 355-382, 510-515.
Lecture/discussion: David Lucsko
FIRST DRAFT OF ESSAY DUE (April 14)
- W 16 Apr **Aeronautics and the systems approach**
Reading: Cowan, pp. 249-256.
Guest speaker: Dr. Deborah Douglas (MIT Museum)
- M 21 Apr Patriots' Day - Holiday
- W 23 Apr **World War II: A technological turning point?**
Read: Cowan, pp. 256-270.
Guest speaker: Prof. David Mindell (STS, MIT)
- M 28 Apr **Film:** "The Day After Trinity"
- W 30 Apr **A New World: Technology in Coldwar America**
Reading: Smith & Clancey, pp. 427-469.
- M 5 May **Computers and control**
Reading: Smith & Clancey, pp. 471-496, 516-518; Cowan, pp. 273-299.
 also read David Noble, "Social Choice in Machine Design"
 (on reserve).
Film: "Automation" (with Edward R. Murrow, 1957)
- W 7 May **Nature's revenge**
Film: "Rachel Carson's Silent Spring"
Read: Smith & Clancey, pp. 301-327, 384-426; Cowan, pp. 301-327.

*****FINAL DRAFT OF ESSAY DUE, MAY 9*****

M 12 May **Technology and popular culture**
Lecture: Shane Hamilton on the electric guitar

W 14 May **Technology and terrorism: Sept. 11**
Film: "MIT Teach-in"
Guest speaker: Prof. Rosalind Williams

LIST OF ACCEPTABLE BOOKS FOR REVIEW

Hugh G. J. Aitken, Taylorism at Watertown Arsenal (1960). A study of the introduction of scientific management at a government arsenal near here and the controversies it raised. This book also was re-issued in 1984 under the title Scientific Management in Action.

Lindy Biggs, The Rational Factory: Architecture, Technology, and Work in America's Age of Mass Production (1996);

Robert V. Bruce, Alexander Graham Bell and the Conquest of Solitude (1973). Biography.

Martin Campbell-Kelly and William Aspray, Computer (1996). The spread of computer culture since the 1970s.

Thomas C. Cochran, Frontiers of Change (1981). A business historian's perspective on early industrialization.

Gail Cooper, Air-Conditioning in America: Engineers and the Controlled Environment, 1900-1960 (1998). The standard work on the subject.

Ruth S. Cowan, More Work for Mother (1983). re. gender and technology. A classic.

William Cronon, Nature's Metropolis: Chicago and the Great West (1991). An important study of how Chicago became the "metropolis" of the West.

Charles Dew, Bond of Iron (1994). The lives and labors of slave ironworkers in the Great Valley of Virginia.

Thomas Dublin, Women at Work (1979). About women textile workers at Lowell.

Colleen A. Dunlavy, Politics and Industrialization (1994). A comparative study of American and German railroads in the 19th century (with emphasis on the role of the state).

Paul N. Edwards, The Closed World: Computers and the Politics of Discourse in Cold War America (1996).

John Ellis, A Social History of the Machine Gun (1975).

Eugene S. Ferguson, Engineering and the Mind's Eye (1992). Among other things, the artistic

side of engineering.

Deborah K. Fitzgerald, The Business of Breeding: Hybrid Corn in Illinois, 1890-1940 (1990).

Robert B. Gordon and Patrick M. Malone, The Texture of Industry (1994). An important treatment of the material culture and archeology of 19th-century industrialization.

Loren R. Graham, The Ghost of the Executed Engineer (1993). A fascinating study about a Soviet engineer who was imprisoned and executed for speaking out against the government.

Daniel Headrick, The Tools of Empire (1981). A non-American book about technology and imperialism in the 19th century.

David A. Hounshell, From the American System to Mass Production (1984). A definitive study of the origins of interchangeable manufacturing and mechanization of industry, culminating with the mass production of the Model T Ford.

Thomas P. Hughes, American Genesis (1989). A general survey of technology in America from the 1870s to the 1970s.

Thomas P. Hughes, Rescuing Prometheus (1998). A history of large engineering projects in the United States since World War II.

Louis C. Hunter, Steamboats on Western Rivers (1949). The definitive work on steamboating on the Ohio and Mississippi Rivers. Be forewarned, however, it is a big book!

R. Douglas Hurt, American Farm Tools (1982). A study that covers everything from plows to steam engines.

Andrew C. Isenberg, The Destruction of the Bison (2000).

Paul Israel, Edison (1999). A prize-winning biography.

Paul Israel, From Machine Shop to Industrial Laboratory (1992). How research and development in the early telegraph industry became increasingly scientific.

Kenneth T. Jackson, Crabgrass Frontier: The Suburbanization of America (1985).

Robert Kanigel, The One Best Way (1997). Biography of Frederick W. Taylor.

John F. Kasson, Civilizing the Machine (1976). Technology, politics, and culture in 19th-century America.

Bruce Laurie, Artisans into Workers (1989). A labor historian's perspective on the industrial revolution.

Edwin T. Layton, The Revolt of the Engineers (1971). Engineers as reformers in early 20th-century America.

Stuart W. Leslie, Boss Kettering (1983). Bio of the famous inventor of the electric starter, among other things.

Stuart W. Leslie, The Cold War and American Science (1993).

Walter Licht, Working for the Railroad (1983). A labor-oriented history.

Karen Lucie, Charles Sheeler and the Cult of the Machine (1991). How an early 20th century artist responded to the machine age.

Leo Marx, The Machine in the Garden. A pathbreaking book about literary responses to technological change in 19th-century America. First published in 1964, but read the 2000 edition which includes an afterward by the author.

Patrick M. Malone, The Skulking Way of War (1991). How New England Indians adopted firearms and the implications it had for warfare in colonial America.

Roland Marchand, Advertising the American Dream (1985). A classic study of modern advertising.

Donald MacKenzie, Inventing Accuracy (1990). The development of missile guidance systems at Draper Labs. One of the best books in the field.

Victor K. McElheny, Insisting on the Impossible (1998). Biography of Edwin Land, inventor of instant photography and founder of Polaroid.

Clay McShane, Down the Asphalt Path (1981). Autos in urban America.

Stephen Meyer, The Five Dollar Day (1981). About Henry Ford and his workers.

Douglas T. Miller, The Birth of Modern America, 1820-1850 (1970). A general history of the period.

David A. Mindell, War, Technology, and Experience Aboard the USS Monitor (2000).

David A. Mindell, Between Human and Machine: Feedback, Control, and Computing Before Cybernetics (2002). The best book in existence on the pre-history of modern computing. Mindell is a member of MIT's STS faculty.

Thomas Misa, Nation of Steel (1995). About the rise of the steel industry in late 19th-century America. The best book on the subject.

- David F. Nye, Electrifying America (1990). A cultural historian's perspective on the subject.
- Maureen Ogle, All the Modern Conveniences: American Household Plumbing, 1840-1890 (1996).
- Robert C. Post, High Performance (1994). About top fuel dragsters.
- Joseph W. Roe, English and American Tool Builders (1916). History of machine tools.
- Kirkpatrick Sale, The Fire of His Genius: Robert Fulton and the American Dream (2001). Biography of Robert Fulton, artist and steamboat inventor.
- Virginia Scharff, Taking the Wheel: Women and the Coming of the Motor Age (1991).
- Wolfgang Schivelbusch, The Railway Journey: Trains and Travel in the 19th Century (1979).
- Wolfgang Schivelbusch, Disenchanted Night (1988).
- Carol Sheriff, The Artificial River: The Erie Canal and the Paradox of Progress, 1817-1862 (1996).
- Mark M. Smith, Mastered by the Clock: Time, Slavery, and Freedom in the American South (1997).
- Merritt Roe Smith, Harpers Ferry Armory and the New Technology (1977). Treats the origins of the "American system" of manufacturing and the responses to it.
- Susan Smulyan, Selling Radio (1994).
- Jacob Vander Meulen, Building the B-29 (1995).
- Walter Vincenti, What Engineers Know and How They Know It (1990). An eminent aeronautical engineer's perspective on the history of engineering.
- M. Mitchell Waldrop, The Dream Machine: J. C. R. Licklider and the Revolution that Made Computing Personal (2001).
- Anthony F. C. Wallace, Rockdale (1978). Historical ethnography of a textile manufacturing community in southeastern Pennsylvania prior to the Civil War.
- John H. White, John Bull (1981). White, a leading student of railroads, writes about an early locomotive that is on exhibit at the Smithsonian Institution. Whoever reviews this book should pay a visit to the "John Bull" at the Smithsonian's National Museum of American History.

Lynn H. White, Jr., Medieval Technology and Social Change (1962).

Richard White, The Organic Machine: The Remaking of the Columbia River (1998). An environmental history.

G. Pascal Zachary, Endless Frontier (1997). Biography of MIT's Vannevar Bush.