

UNIVERSITY OF WISCONSIN-MADISON
Department of History
Semester I, 1990-91

History 411

Prof. Dunlavy

HISTORY OF AMERICAN TECHNOLOGY

This class offers a survey of the history of American technology from colonial times to the present. With the aid of secondary and primary readings, we will explore some of the ways in which American technology has changed over the centuries, paying particular attention to two aspects of the process of change: origins and consequences. In other words, this is not a survey of the "nuts and bolts" of American technological development; although you will certainly know about the "facts" of technological change by the end of the semester, we will focus on the underlying forces that pushed change in one direction rather than another and on the social consequences. In addition, the written assignments will improve both your essay-writing skills and your powers of critical analysis (i.e., your ability to read closely and to think logically)--provided that you do your part, of course.

COURSE REQUIREMENTS, MECHANICS, ETC.

1. This is a three-credit class, which meets three times a week for 50 minutes. Lectures will be interspersed with discussions of assigned readings.
2. *Required Reading:* The following book is available at the University Bookstore:

Alan I. Marcus and Howard P. Segal, *Technology in America: A Brief History* (Harcourt Brace Jovanovich, 1989).

The other readings are contained in two readers that are available for purchase at Bob's Copy Shop (56 University Square). Part I, which includes only the first weeks' readings, will be ready Friday (perhaps Thursday afternoon); Part II will be ready next week. A copy of Part II will also be put on reserve at Helen C. White Library.

3. *Written Work:* Over the course of the semester, you will have four written assignments.

The first two are take-home essays, each a maximum of five pages in length (typed, doubled-spaced, 1"-margins). You will have a week to write each of these essays, which will draw on the lectures and class discussions as well as assigned readings. These essays serve two purposes: they will require you to think *synthetically, succinctly*, and (in the best of all possible worlds) *creatively* about the readings and lectures; and they will provide an opportunity for you to hone your

Written Work, cont'd.

writing and analytical skills. (Please note that the syllabus includes a lecture on writing essays. You may have great ideas, but, if you cannot convey them in written form, who will ever know? Besides, there is nothing that will force you to clarify your thinking like the process of trying to put it down in comprehensible form on paper.)

The third assignment is a brief research paper, in which you will explore the impact of the Civil War on a particular technology or aspect of technological development. These should be no longer than ten pages of text (typed, doubled-spaced) plus footnotes and bibliography.

The fourth and final assignment, like the first two, is a take-home essay, no more than ten pages (typed, doubled-spaced). This is due during exam week.

4. *4th Credit or Honors:* Those who are taking the course for four credits will do a research paper like the other students; they, however, will revise and expand the paper. Honors students will, in addition, submit an even more extensive bibliography (one that demonstrates ingenious and creative research techniques, of course).
5. *Plagiarism:* A word of warning to the wise. Please feel free to discuss your essays-in-progress with your classmates, but **WRITE YOUR OWN ESSAYS**. As everyone knows, plagiarism is a problem on this campus. The worst of its consequences is that it takes its toll on serious students, for a common solution to the problem is to require in-class essay exams, which means that students have few opportunities to improve their writing. In this class you will have the opportunity to labor over your writing, and I will give you rather detailed feedback. But **KEEP YOUR NOTES AND DRAFTS**. I will ask for them if I see any tell-tale signs of plagiarism in your paper.
6. *General Advice* about studying for this class:
 - a. The text by Marcus and Segal provides a serviceable chronological and topical framework for the course (although it is not the most stimulating reading). Read it quickly and use it often as a reference throughout the semester. The other reading assignments, which explore selected issues in greater depth, should be read more closely.
 - c. Do the readings in the order that they are listed on the syllabus each week. Always read Marcus and Segal first, for example, since their text provides an overview and an

General Advice, cont'd.

introduction to the period or issues. The other readings usually build on one another, so they will make more sense when read in the given order.

- d. Take notes. Take notes. Take notes. Throughout the semester. On everything--not only on the lectures but also on the assigned readings. (The act of note-taking will help you to understand the readings better and this in turn will enhance our discussions. Also, being able to review your notes on the readings and lectures will allow you to make better use of the weeks allotted for writing the essays.)
 - e. Take some time each week to think about how the lectures, readings, and discussions fit together--i.e., to step back and ponder the larger picture. This is good practice for the essays.
 - f. If you are troubled by any aspect of the class, lectures, or readings, or if you would simply like to discuss something in greater depth, *please feel free to stop by my office during office hours.*
7. Grades will be based on: first take-home essay, 15 percent; second take-home essay, 20 percent; research paper 25 percent each; fourth essay, 30 percent; attendance and participation, 10 percent.

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Office Hours (4116 Humanities)
Mondays, 2:15-3:45 p.m.
Thursdays, 4:30-6:00 p.m.
or by appointment
(263-1854)

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LECTURE TOPICS AND READING ASSIGNMENTS

- SEPT. 5 Introduction, Class Mechanics, etc.
 SEPT. 7 Recurrent Themes and New Directions in the History of American Technology

Assigned Reading

- Raymond Williams, *Keywords: A Vocabulary of Culture and Society*, "Mechanical," "Industry," and "Capitalism." [handout]
 Marcus and Segal, *Technology in America*, pp. iii-v.
 Langdon Winner, *The Whale and The Reactor: A Search for Limits in the Age of High Technology* (Chicago: University of Chicago Press): required reading, pp. 19-39 ("Do Artifacts Have Politics?"); recommended reading, pp. 3-18 ("Technologies as Forms of Life") and pp. 40-58 ("Techne and Politeia") [these are included in the reading packet].
 Joan Rothschild, "From Sex to Gender in the History of Technology," in *In Context: History and the History of Technology*, eds. Stephen H. Cutcliffe and Robert C. Post (Bethlehem: Lehigh University Press; London: Associated University Presses, 1989), pp. 192-203.
 David A. Hounshell, "Rethinking the History of 'American Technology,'" in *ibid.*, pp. 216-29.

- SEPT. 10 The American Colonies: Life on the Periphery
 SEPT. 12 Colonial Technologies of Production and Distribution
 SEPT. 14 Revolution and Constitution-Making

Assigned Reading

- Marcus and Segal, *Technology in America*, Chapter 1 (pp. 1-51).
 Drew R. McCoy, *The Elusive Republic: Political Economy in Jeffersonian America* (New York: W. W. Norton, 1980), pp. 1-47.

- SEPT. 17 The Challenge to Republican Values
 SEPT. 19 The War of 1812: Technological Independence?
 SEPT. 21 Writing Good Essays (first essay assignment will be handed out)

Assigned Reading

- Marcus and Segal, *Technology in America*, Chapter 2 (pp. 42-87).
 John F. Kasson, *Civilizing the Machine: Technology and Republican Values in America, 1776-1900* (Penguin Books, 1976), pp. 3-51 ("The Emergence of Republican Technology")

- SEPT. 24 The First "American System"
 SEPT. 26 The Industrial Revolution: An Overview
 SEPT. 28 No Class - first take-home essay due (max. 5 pp.)

Assigned Reading

Marcus and Segal, *Technology in America*, Chapter 3
 (pp. 88-132).

- OCT. 1 The American Variant: Wood- and Water-Based
 Industrialization
 OCT. 3 Borrowed Technology: European Technology in the
 New Nation
 OCT. 5 A Second "American System": Interchangeable-Parts
 Manufacturing Technology

Assigned Reading

Darwin H. Stapleton, *The Transfer of Early Industrial
 Technologies to America* (Philadelphia: American
 Philosophical Society, 1987), pp. 72-121 ("Eleuthère
 Irénée du Pont: *Elève des Poudres* to American
 Gunpowder Manufacturer").

Merritt Roe Smith, "Army Ordnance and the 'American
 System' of Manufacturing, 1815-1861," in *Military
 Enterprise and Technological Change: Perspectives on
 the American Experience* ed. Merritt Roe Smith
 (Cambridge, Mass.: M.I.T. Press, 1985), pp. 39-86.

- OCT. 8 The Role of the "State" in American Industrialization
 OCT. 10 Sectors of Change: Agriculture and Energy
 OCT. 12 Sectors of Change: Canals, Railroads, or--Steam Cars??
 (second essay assignment will be handed out)

Assigned Reading

David A. Hounshell, *From the American System to Mass
 Production, 1800:1932: The Development of
 Manufacturing Technology in the United States*
 (Baltimore: Johns Hopkins University Press, 1984),
 pp. 67-123 ("The Sewing Machine and the American
 System of Manufactures").

Ava Baron and Susan E. Klepp, "'If I Didn't Have My
 Sewing Machine . . .': Women and Sewing Machine
 Technology," in *A Needle, A Bobbin, A Strike: Women
 Needleworkers in America* eds. Joan M. Jensen and Sue
 Davidson (Philadelphia: Temple University Press,
 1984), pp. 20-59.

- OCT. 15 Sectors of Change: Iron Manufacturing
 OCT. 17 Alternative Paths? The Case of Textile Manufacturing
 OCT. 19 No Class - second take-home essay due

Assigned Reading

Philip Scranton, *Proprietary Capitalism: The Textile Manufacture at Philadelphia, 1800-1885* (Cambridge: Cambridge University Press, 1983), pp. 1-71.

- OCT. 22 Labor in Antebellum Industrialization
 OCT. 24 Industrialization and the Civil War
 OCT. 26 Discussion of research topics on the impact of the Civil War

Assigned Reading

Walter Licht, *Working for the Railroad: The Organization of Work in the Nineteenth Century* (Princeton: Princeton University Press, 1983), pp. 79-124 (Ch. 3, "Working to Rule").

T. W. Van Metre, "Internal Commerce of the United States," (1915) [extract on the impact of the Civil War] in *American Economic Development Since 1860*, ed. William Greenleaf (New York: Harper & Row, Harper Torchbooks, 1968), pp. 258-66.

Thomas C. Cochran, "Did the Civil War Retard Industrialization?" in *The Economic Impact of the American Civil War*, ed. Ralph Andreano (Cambridge, Mass.: Schenkman Publishing, 1962), pp. 148-60.

Stephen Salisbury, "The Effect of the Civil War on American Industrial Development," in *ibid.*, pp. 161-68.

A. Hunter Dupree, "Science and Technology," in *Economic Change in the Civil War Era*, ed. David T. Gilchrist and W. David Lewis (Greenville, Del.: Eleutherian Mills-Hagley Foundation, 1965), pp. 117-22.

- OCT. 29 Writing Research Papers
 OCT. 31 From "Mechanics and Inventors" to "Engineers":
 Systematizing Engineering and Invention
 NOV. 2 The Second Industrial Revolution (a.k.a. The First
 Industrial Divide)
 Extra office hours this week: F 2:15 - 5:00 p.m.

Assigned Reading

Marcus and Segal, *Technology in America*, Chapter 4-5 (pp. 133-219).

Hans-Joachim Braun, "The National Association of German-American Technologists and Technology Transfer between Germany and the United States, 1884-1930," *History of Technology* 8 (1983): 15-35.

- NOV. 5 Celebrating Technology--and Worrying About It, Too
Extra office hours this week: M 9 a.m. - 12 p.m. and
T 9 a.m. - 12 p.m.
- NOV. 7 No class - work on research papers
- NOV. 9 No class - research papers due (max. 10 pp.)

(No reading assignment this week)

- NOV. 12 Early 20th-Century Isms: 1. Fordism
- NOV. 14 Early 20th-Century Isms: 2. Taylorism
- NOV. 16 Early 20th-Century Isms: 3. Consumerism

Assigned Reading

Marcus and Segal, *Technology in America*, pp. 220-54.

Thomas P. Hughes, *American Genesis: A Century of
Invention and Technological Enthusiasm* (New York:
Penguin Books, 1989), pp. 184-248 [on Fordism and
Taylorism].

Martha Moore Trescott, "Lillian Moller Gilbreth and the
Founding of Modern Industrial Engineering," in
Machina Ex Dea: Feminist Perspectives on Technology
(New York: Pergamon Press, 1983), pp. 23-37.

- NOV. 19 Technology and the Great War
- NOV. 21 Technology in the Great Depression: The Problem or the
Solution?
- NOV. 23 THANKSGIVING BREAK

Assigned Reading

Marcus and Segal, *Technology in America*, Chapter 7
(pp. 255-314).

William E. Akin, *Technocracy and the American Dream: The
Technocrat Movement, 1900-1941* (Berkeley: University
of California Press, 1977), pp. ix-xiii, 27-45,
64-96, 131-48.

Howard Scott et al., *Introduction to Technocracy* (New
York: Technocracy, Inc. 1936), pp. 7-36.

- NOV. 26 War Baby: The Military-Industrial-University Complex
- NOV. 28 The Bomb
- NOV. 30 Sputnik and the Space Race

Assigned Reading

John Kenly Smith, Jr., "World War II and the
Transformation of the American Chemical Industry," in
Science, Technology and the Military, eds. Everett
Mendelsohn, Merritt Roe Smith, and Peter Weingart
(Dordrecht: Kluwer Academic Publishers, 1988),
pp. 307-22. * * * * * (continued next page)

Assigned Reading, cont'd.

Thomas J. Misa, "Military Needs, Commercial Realities, and the Development of the Transistor, 1948-1958," in *Military Enterprise and Technological Change: Perspectives on the American Experience* ed. Merritt Roe Smith (Cambridge, Mass.: M.I.T. Press, 1985), pp. 251-287.

James G. Hershberg, "'Over My Dead Body': James B. Conant and the Hydrogen Bomb," in *Science, Technology and the Military*, eds. Everett Mendelsohn, Merritt Roe Smith, and Peter Weingart (Dordrecht: Kluwer Academic Publishers, 1988), pp. 379-430.

- DEC. 3 Modern Technology and Its Critics: The Alternative
Technology Movement
DEC. 5 The Limits of Mass Production
DEC. 7 The Computer Revolution (Finally) Arrives

Assigned Reading

Marcus and Segal, *Technology in America*, Chapter 8 (pp. 315-64).

David F. Noble, "Social Choice in Machine Design: The Case of Automatically Controlled Machine Tools," in *Case Studies in the Labor Process*, ed. Andrew Zimbalist, (New York: Monthly Review Press), pp. 18-50.

Barbara Baran, "The Technological Transformation of White-Collar Work: A Case Study of the Insurance Industry," in *Computer Chips and Paper Clips: Technology and Women's Employment*, Vol. 2: *Case Studies and Policy Perspectives* ed. Heidi L. Hartmann (Washington, D.C.: National Academy Press, 1987), pp. 25-62.

(Week 15)

- DEC. 10 Guest Speaker from the Allen-Bradley Company, Milwaukee, a leading manufacturer of industrial automation systems
DEC. 12 A Second Industrial Divide? (final essay question will be handed out)
DEC. 14 Review

Assigned Reading

Merritt Roe Smith, "Technology, Industrialization, and the Idea of Progress in America," in Kevin Byrne, ed., *Responsible Science: The Impact of Technology on Society* (San Francisco: Harper & Row, 1986), pp. 1-30.

* * Final essay (max. 10 pp.) due Wednesday, Dec. 19, 4:00 p.m. * *