

MHB 668-002/HS 668-002:

Topics in the History of Medicine: Medical Technologies in Historical Perspective

TR 1:00 PM – 2:15pm, 10 AG HALL, University of Wisconsin-Madison

*** Method of Instruction: Seminar • Class List: medhist668-2-s10@lists.wisc.edu**

Instructor Information:

Course Instructor: Prof. Dayle B. DeLancey, Ph.D.

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Office: MSC 1410 (1300 Univ. Ave.)

Office Hours: TR 2:25 PM - 3:25 PM (MSC 1410), or by appointment.

Course Description:

From imaging devices to pharmaceuticals, medical technologies are often among the most novel and controversial aspects of contemporary society. Yet, U.S. history reveals that neither the emergence of high-profile medical technologies nor the dilemmas that often accompany their arrival are strictly 'modern-day' phenomena. History also demonstrates that such technologies tend to reflect not only the medical science, but also the social concerns, of the periods in which they have emerged. In this course, we will explore the ways in which a range of technologies – e.g. stethoscopes, spirometers, sphygmomanometers, hospital design, x-rays, reproductive technologies, gene therapy, virtual medicine, etc. – have at once shaped medicine and invited critique. Using readings from a range of sources illuminating key medical technologies in the 18th- to 21st-century U.S., we will analyze these technologies in historical, social, and theoretical context. Questions guiding our work will include: What are the historical roots of significant medical technologies? How did these technologies shape medicine? Why have physicians and the public embraced some medical technologies and not others? What non-medical technologies have influenced the development of medical technologies? How has the historiography of medical technology shaped the histories of medicine and science as academic disciplines? Has medical technology ever been 'value free'?

Course Prerequisites: Junior standing

Grading & Assessment: *Each student's final grade will be derived from the following elements:*

- * In-class Discussion: 30%
- * In-class Reading and Research Journal Entries: 15%
- Literature Review Essay on Topic of Final Research Paper: 15% (**Due March 5, 5 PM**)
 - 1500 words (about 6 pp) for undergraduates
 - 2500 words (about 10 pp) for graduate students
- Final Research Paper: 30% (**Due May 7, 5 PM**)
 - 3750 words (about 15 pp) for undergraduates
 - 6000 words (about 24 pp) for graduate students
- Oral Presentation Overview of Final Research Paper: 10%

* Because we are conducting this course in seminar format, **thorough preparation of assigned reading and active participation in classroom discussion are required of each student and comprise a large portion of each student's final grade.**

Required Readings – ELECTRONIC READER: All course readings are contained in the course's ELECTRONIC READER, available at EBLING LIBRARY RESERVES:

<https://www.library.wisc.edu/course-pages/viewer/show/2424>

- **Students must print out copies of course readings to bring to class meetings, as the use of laptops, hand-held devices, or cell/mobile telephones is prohibited during our class sessions.**
- 'Further Reading' is not required, but is instead listed for your own future use.

In compliance with the Americans with Disabilities Act, I urge any student with a disability to inform me as soon as possible, so that I may make any necessary accommodations to ensure full participation and facilitate educational accessibility. All such requests are confidential.

Students are expected to familiarize themselves with UW policies on plagiarism and to assume full responsibility for academic integrity in all coursework.

Course Objectives:

Upon completion of this course, students should know, understand, and be able to use concrete examples to explain the following in appropriate historical and social context:

- The development, emergence, legacies, and antecedents of some landmark medical technologies.
- Medical technology's role within and/or impact upon:
 - the practice of medicine;
 - conduct of medical research;
 - production and revision of medical knowledge – including disease concepts;
 - medical professionals, professions, and institutions.
- Medical technology's impact upon the experience of the patient.
- Medical technology's relationships with industry.
- Medical technology's relationships with commercial markets.
- Significant theoretical and/or historiographic approaches to the study of medical technologies.
- Key controversies in the development and/or use of medical technologies.
- Medical technologies and bioethics, including questions of allocation, justice, and risk.
- Interactions between medical technologies and ethnicity, race, gender, class, and religion.
- The means of assessing the efficacy and value of medical technologies.

WEEK 1: COURSE INTRODUCTION, THEORY, & BACKGROUND

TUESDAY, JANUARY 19, 2010:

COURSE INTRODUCTION: PERSONAL INTRODUCTIONS, HOUSEKEEPING ISSUES, SYLLABUS REVIEW, OVERVIEW OF MAJOR THEMES

- **PLEASE SPREAD THE WORD:** If you know of other students who have space in their course schedules and would be interested in the themes and design of this course, please let them know about the course either before our next meetings on January 21 and January 26. Thanks in advance!

THURSDAY, JANUARY 21, 2010:

THEORY AND BACKGROUND

Robert L. Heilbroner, "Do Machines Make History?," *Technology and Culture*, 8.2 (1967), 335-345.

John Harley Warner, "Science in Medicine," *Osiris*, 2nd Series, Vol. 1, Historical Writing on American Science. (1985), pp. 37-58.

*Trevor Pinch and Wiebe E. Bijker, "The Social Construction of Facts and Artifacts: Or how the Sociology of Science and the Sociology of Technology Might Benefit Each Other", in Wiebe E. Bijker, Thomas Hughes and Trevor Pinch, eds, *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology* (Cambridge, MA: MIT Press, 1987), 17-50.

* Many students find this highly-influential article tough going when they sit down to read it. Please: (1) simply read for the main idea of each section and then craft an outline of the article's argument and (2) feel free to simply* skim* the many diagrams and flowcharts in the article!

Further Reading:

Melvin Kranzberg, "Technology and History: 'Kranzberg's Laws'," *Technology and Culture*, 27.3 (1986), 544-560.

R. A. Buchanan, "Theory and Narrative in the History of Technology," *Technology and Culture*, 32.2 (1991), 365-376.

Week 2: THE STETHOSCOPE: The Disappearance of the 'Sick-Man'? Part One

TUESDAY, JANUARY 26, 2010

Malcolm Nicolson, "The Art of Diagnosis: Medicine and the Five Senses," in W. F. Bynum and Roy Porter, eds., *Companion Encyclopedia of the History of Medicine, Volume 2* (London and New York: Routledge, 1993), 801-825.

Stanley Joel Reiser, *Medicine and the Reign of Technology* (Cambridge: Cambridge University Press, 1978), "Chapter 1: Examination of the Patient in the Seventeenth and Eighteenth Centuries," 1-22.

THURSDAY, JANUARY 28, 2010

Reiser, *Medicine and the Reign of Technology*, "Chapter 2: The Stethoscope and the Detection of Pathology by Sound," 23-44.

Audrey B. Davis, "The Stethoscope," *Medicine and Its Technology: An Introduction to the History of Medical Instrumentation* (Westport, CT and London: Greenwood Press, 1981), 87-116.

*Nicholas D. Jewson, "The Disappearance of the Sick-Man from Medical Cosmology, 1770-1870," *Sociology*, 10.2(1976), 225-244.

* Because the stethoscope and the microscope are the two central technologies in Jewson's argument, we will be reading this article in the stethoscope unit, then reviewing it for further discussion in the microscope unit!

Week 3: THE MICROSCOPE: The Disappearance of the 'Sick-Man'? Part Two

TUESDAY, FEBRUARY 2, 2010

Reiser, "Chapter 4: The Microscope and the Revelation of a Cellular Universe," *Medicine and the Reign of Technology*, 69-90.

C. Heitzman, "The Aid which Medical Diagnosis Receives from Recent Discoveries in Microscopy," *Archives of Medicine (New York)*, 1(1879): 44-67. Reprinted in: Howell, ed., *Technology and American Medical Practice* (New York and London: Garland, 1988, 33-40.

THURSDAY, FEBRUARY 4, 2010

Deborah Jean Warner, "The Campaign for Medical Microscopy," *Bulletin of the History of Medicine*, 69(1995): 367-386.

James H. Cassedy, "The Microscope in American Medical Science, 1840-1860," *Isis*, 67.1(1976), 76-97.

*Nicholas D. Jewson, "The Disappearance of the Sick-Man from Medical Cosmology, 1770-1870," *Sociology*, 10.2(1976), 225-244.

*** Because the stethoscope and the microscope are the two central technologies in Jewson's argument, we read this article in the stethoscope unit, and are now reviewing it for further discussion in the microscope unit!**

Week 4: THE SPIROMETER & THE SPHYGMOMANOMETER: Measuring Physiology

TUESDAY, FEBRUARY 9, 2010

Reiser, "Chapter 5: The Translation of Physiological Actions into the Languages of Machines," *Medicine and the Reign of Technology*, 91-121.

Davis, "Concepts of the Pulse and Instruments," *Medicine and Its Technology* (Westport, CT and London: Greenwood Press, 1981), 87-116.

Alexander Rattray, "The Spirometer in Diagnosis," *Pacific Medical and Surgical Journal*, 22(1879-1880), 110-117. Reprinted in: Howell, ed., *Technology and American Medical Practice* (New York and London: Garland, 1988, 33-40.

THURSDAY, FEBRUARY 11, 2010

Lundy Braun, "Spirometry, Measurement, and Race in the Nineteenth Century," *Journal of the History of Medicine and Allied Sciences*, 60.2(2005), 135-169.

Hughes Evans, "Losing Touch: The Controversy over the Introduction of Blood Pressure Instruments into Medicine," *Technology and Culture*, Special Issue: Biomedical and Behavioral Technology, Vol. 34.4(1993), 784-807.

Week 5: X-RAYS AND VISUAL TECHNOLOGIES: The Atomized or Transparent Patient

TUESDAY, FEBRUARY 16, 2010

Reiser, "Chapter 3: Visual Technology and the Atomization of the Living," *Medicine and the Reign of Technology*, 45-68.

Bettyann Holzmann Kevles, *Naked to the Bone: Medical Imaging in the Twentieth Century* (New York: Basic Books, 1997), as follows:

- "Chapter 1, The Discovery of X-Rays: Seeing Is Believing," 9-32.
- "Chapter 2, Medical Applications: The Living Body beneath the Skin," 33-53.

THURSDAY, FEBRUARY 18, 2010

Kevles, *Naked to the Bone*, as follows:

- "Chapter 3, Technological Innovation 1897-1918: Building a Better Mousetrap," 54-76.
- "Chapter 4, Medical Politics between the Wars: Setting Standards," 77-96.
- "Chapter 5, Technological Innovation 1910-1918: Sharper, Clearer, Deeper," 97-115.

Further Reading:

B. Koch, "In the Image of Science? Negotiating the Development of Diagnostic Ultrasound in the Cultures of Surgery and Radiology," *Technology and Culture*, Special Issue: Biomedical and Behavioral Technology, 34.4 (1993), 858-893.

Week 6: DIAGNOSTIC LABORATORY TECHNOLOGY: Case Studies in Blood

****ALERT: LITERATURE REVIEW ESSAY DUE NEXT WEEK, BY 5 PM ON MARCH 5.****

TUESDAY, FEBRUARY 23, 2010

Reiser, "Chapter 6: Chemical Signposts of Disease and the Birth of a Diagnostic Laboratory," *Medicine and the Reign of Technology*, 122-143.

Ross C. Whitman, "The Technique of Blood Examination," *The Chicago Medical Recorder* 26(1904): 24-37. Reprinted in: Howell, ed., *Technology and American Medical Practice* (New York and London: Garland, 1988, 33-40.

Keith Wailoo, "Introduction: Putting the Question to Technology," in *Drawing Blood: Technology and Disease Identity in Twentieth-Century* (1997; Baltimore: Johns Hopkins University Press, 1999), 1-16.

THURSDAY, FEBRUARY 25, 2010

Wailoo, *Drawing Blood*, as follows:

- "Chapter 2, The Rise and Fall of Splenic Anemia: Surgical Identity and Ownership of a Blood Disease," 46-72.
- "Chapter 4, The Corporate 'Conquest' of Pernicious Anemia: Technology, Blood Researchers, and the Consumer," 99-133.

Further Reading:

Wailoo, *Drawing Blood*, "Chapter 5, Detecting 'Negro' Blood: Black and White Identities and the Reconstruction of Sickle Cell Anemia," 134-161, "Chapter 6, The Forces That Are Molding Us: The National Politics of Blood and Disease after World War II," 182-187 and "Conclusion," 188-200.

****ALERT! LITERATURE REVIEW ESSAY DUE NEXT WEEK, BY 5 PM ON MARCH 5.****

Week 7: HOSPITAL TECHNOLOGY: Technology in Hospitals, Hospitals as Technology

****ALERT! LITERATURE REVIEW ESSAY DUE THIS WEEK, BY 5 PM ON MARCH 5.****

TUESDAY, MARCH 2, 2010

Reiser, "Chapter 7: Medical Specialism and the Centralization of Medical Care," *Medicine and the Reign of Technology*, 144-157.

Joel D. Howell, "Physicians, Patients, and Medical Technology" in *Technology and the Hospital: Transforming Patient Care in the Early Twentieth Century* (Baltimore: Johns Hopkins University Press, 1996), 1-29.

THURSDAY, MARCH 4, 2010

Howell, *Technology and the Hospital*, as follows:

- "Science, Scientific Systems, and Surgery: Technology and the U.S. Hospital," 30-67.
- "Machines and Medicine: Lessons from the Early Twentieth Century," 227-249.

Further Reading:

Jeanne Kisacky, "Restructuring Isolation: Hospital Architecture, Medicine, and Disease Prevention," *Bulletin of the History of Medicine*, 79.1(2005), 1-49.

Lindsay Prior, "The Architecture of the Hospital: A Study of Spatial Organization and Medical Knowledge," *The British Journal of Sociology*, Vol. 39, No. 1. (1988), 86-113.

****ALERT! LITERATURE REVIEW ESSAY DUE BY THIS WEEK, 5 PM ON MARCH 5.****

Week 8: PHARMACEUTICALS: Technological Products of Science, Medicine, and Industry

TUESDAY, MARCH 9, 2010

Charles E. Rosenberg, "The Therapeutic Revolution: Medicine, Meaning, and Social Change in America," in Morris J. Vogel and Charles E. Rosenberg, eds., *The Therapeutic Revolution: Essays in the Social History of American Medicine* (Philadelphia: University of Pennsylvania Press, 1979), 3-25. Reprinted in Judith Walzer Leavitt and Ronald L. Numbers, eds., *Sickness and Health in America: Readings in the History of Medicine and Public Health*, Second Edition (Madison, WI: University of Wisconsin Press, 1985), 39-52.

Nancy Tomes, "The Great American Medicine Show Revisited," *Bulletin of the History of Medicine*, 79.2(2005): 627-663.

THURSDAY, MARCH 11, 2010

Nicolas Rasmussen, "The Drug Industry and Clinical Research in Interwar America: Three Types of Physician Collaborator," *Bulletin of the History of Medicine*, 79.1(2005), 50-80.

Jeremy A. Greene, "Releasing the Flood Waters: Diuril and the Reshaping of Hypertension," *Bulletin of the History of Medicine*, 79.4(2005), 749-795.

Further Reading:

Chris Feudtner, "The Want of Control: Ideas, Innovations, and Ideals in the Modern Management of Diabetes Mellitus," *Bulletin of the History of Medicine*, 69.1(2005), 66-90.

Week 9: GENETIC TECHNOLOGIES: Ethnicity, Race, Commerce, and 'Science's Holy Grail'

TUESDAY, MARCH 16, 2010

Daniel J. Kevles, "Out of Eugenics: The Historical Politics of the Human Genome," in Daniel J. Kevles and Leroy Hood, eds. *The Code of Codes: Scientific and Social Issues in the Human Genome Project* (Cambridge, MA: Harvard University Press, 1992): 3-36.

Sally Smith Hughes, "Making Dollars Out of DNA: The First Major Patent in Biotechnology and the Commercialization of Molecular Biology, 1974-1980," *Isis* 92.3(2001): 541-575.

Keith Wailoo and Stephen Pemberton, "Introduction: Ethnic Symbols in Conflicted Times," *The Troubled Dream of Genetic Medicine: Ethnicity and Innovation in Tay-Sachs, Cystic Fibrosis, and Sickle Cell Disease* (Baltimore: Johns Hopkins University Press, 2006), 1-13.

THURSDAY, MARCH 18, 2010

Wailoo and Pemberton, *The Troubled Dream of Genetic Medicine*, as follows:

- "Chapter 2, Risky Business in White America: Gene Therapy and Other Ventures in the Treatment of Cystic Fibrosis," 61-115.
- "Chapter 3, A Perilous Lottery for the Black Family: Sickle Cells, Social Justice, and the New Therapeutic Gamble," 116-174.

Further Reading:

Wailoo and Pemberton, "Chapter 1, Eradicating a 'Jewish Gene': Promises and Pitfalls in the Fight against Tay-Sachs Disease," in *The Troubled Dream of Genetic Medicine*, 14-60.

Week 10: REPRODUCTIVE TECHNOLOGIES: Feminist Theory Meets Technological History
TUESDAY, MARCH 23, 2010

Keith Grint and Steve Woolgar, "On Some Failures of Nerve in Constructivist and Feminist Analyses of Technology," *Science, Technology, & Human Values*, Special Issue: Feminist and Constructivist Perspectives on New Technology, Vol. 20, No. 3, (1995), 286-310.

Ruth Schwartz Cowan, "Genetic Technology and Reproductive Choice: An Ethics for Autonomy," in Kevles and Hood, eds., *Code of Codes*, 244-263.

THURSDAY, MARCH 25, 2010

Kevles, "Looking through Women: The Development of Ultrasound and Mammography," *Naked to the Bone*, 228-260.

Suzanne White Junod and Lara Marks, "Women's Trials: The Approval of the First Oral Contraceptive Pill in the United States and Great Britain," *Journal of the History of Medicine and Allied Sciences* 57.2 (2002), 117-160.

Further Reading:

Elizabeth Siegel Watkins, "'Doctor, Are You Trying to Kill Me?': Ambivalence about the Package Insert for Estrogen," *Bulletin of the History of Medicine* 76.1(2002), 84-104.

NO CLASS

SPRING BREAK WEEK:

NO CLASS MARCH 30 & APRIL 1, 2010

NO CLASS

Week 11-A.: COMPUTER TECHNOLOGY: Beyond Quantification and Automation
TUESDAY, APRIL 6, 2010

Reiser, "Chapter 10: Telecommunication, Automation, and Medical Practice," *Medicine and the Reign of Technology*, 196-226.

Joel D. Howell, "Technologies Transforming Health Care: X-Rays, Computers, and the Internet," in Lester D. Friedman, ed., *Cultural Sutures: Medicine and Media* (Durham and London: Duke University Press, 2004), 333-350.

Thomas Csordas, "Computerized Cadavers: Shades of Being and Representation in Virtual Reality" in Paul Brodwin, ed., *Biotechnology and Culture: Bodies, Anxieties, Ethics* (Bloomington: Indiana University Press, 2000), 173-192.

Week 11-B.: QUESTIONING MEDICAL TECHNOLOGY, PART I:
VACCINES—Coercion, Risk, Personal Freedom, & the Public Good

THURSDAY, APRIL 8, 2010

Alexandra Minna Stern and Howard Markel, "The History of Vaccines and Immunization: Familiar Patterns, New Challenges," *Health Affairs*, 24.3(2005): 611-621.

James Colgrove, "Between Persuasion and Compulsion: Smallpox Control in Brooklyn and New York, 1894-1902," *Bulletin of the History of Medicine* 78.2(2004): 349-378. Rpt. in James Colgrove, *State of Immunity: The Politics of Vaccination in Twentieth-Century America* (Berkeley and Los Angeles: Milbank and the University of California Press, 2006), 17-44.

James Colgrove and Ronald Bayer, "Manifold Restraints: Liberty, Public Health, and the Legacy of *Jacobson v. Massachusetts*" *American Journal of Public Health*, 9(2005): 571-576.

Week 12: QUESTIONING MEDICAL TECHNOLOGY, PART II: Evaluation and Efficacy

TUESDAY, APRIL 13, 2010

Reiser, *Medicine and the Reign of Technology*, as follows:

- “Chapter 8: The Shortcomings of Technology in Medical Decision-Making,” 158-173.
- “Chapter 9: Selection and Evaluation of Evidence in Medicine,” 174-195.

THURSDAY, APRIL 15, 2010

David J. Rothman, “The Iron Lung,” *Beginnings Count: The Technological Imperative in American Health Care* (New York: Oxford, 1997), 42-66.

James H. Maxwell, “The Iron Lung: Halfway Technology or Necessary Step?,” *The Milbank Quarterly* 64 (1986): 3-29.

Lewis Thomas, “Response to James H. Maxwell’s Essay, ‘The Iron Lung’,” *The Milbank Quarterly* 64 (1986): 30-33.

Further Reading:

David S. Jones, “Visions of a Cure: Visualization, Clinical Trials, and Controversies in Cardiac Therapeutics, 1968-1998, *Isis*, Vol. 91, No. 3. (2000), 504-541.

Week 13: QUESTIONING MEDICAL TECHNOLOGY, PART III: Risk, Rationing, and Justice

TUESDAY, APRIL 20, 2010

George J. Annas and Sherman Elias, “Thalidomide and the *Titanic*: Reconstructing the Technology Tragedies of the Twentieth Century,” *American Journal of Public Health*, Vol. 89, No. 1 (1999), 98-101.

Ted Lockhart, “Technological Fixes for Moral Dilemmas,” *Techné: Research in Philosophy and Technology* (e-Journal of the Society for Philosophy and Technology), 1.3-4(1996): 1-13.

Rothman, “Rationing the Respirator,” *Beginnings Count*, 112-131.

THURSDAY, APRIL 22, 2010

Diana Dutton, Thomas A. Preston, and Nancy E. Pfund, eds. *Worse than the Disease: Pitfalls of Medical Progress* (Cambridge: Cambridge University Press, 1988), as follows:

- Preston, “The Artificial Heart,” 91-126.
- Dutton, “Swine Flu Vaccination,” 127- 173.

Rothman, “Rationing the Respirator,” *Beginnings Count*, 112-131.

Further Reading:

Dutton, “What is Possible? Toward Medical Progress in the Public Interest,” in Dutton, Preston, and Pfund, eds., *Worse than the Disease*, 350-381.

Week 14-A: REVIEW AND ASSESSMENT

****ALERT: FINAL RESEARCH PAPER IS DUE NEXT WEEK, BY 5 PM ON MAY 7, 2010!!****

TUESDAY, APRIL 27, 2010

Harry M. Marks, “Medical Technologies: Social Contexts and Consequences,” in Bynum and Porter, eds., *Companion Encyclopedia of the History of Medicine*, Vol. 2, 1592-1618.

Stanley Joel Reiser, “The Science of Diagnosis: Diagnostic Technology,” Bynum and Porter, eds., *Companion Encyclopedia of the History of Medicine*, Vol. 2, 801-825.

Wiebe E. Bijker, “Do Not Despair: There Is Life after Constructivism,” *Science, Technology, & Human Values*, Theme Issue: Technological Choices, Vol. 18, No. 1, (1993), 113-138.

Further Reading:

Emmanuel G. Mesthene, “On Understanding Change: The Harvard University Program on Technology and Society,” *Technology and Culture*, Vol. 6, No. 2 (1965), 222-235.

Week 14-B: WORKSHOP ON FINAL PAPERS

THURSDAY, APRIL 29, 2010

What issues are you facing as you write your final paper for this course? What approaches to writing and organization have been working for you thus far – and which have not? Which materials from our course are you trying to integrate with your own research? During this session, which will be structured and conducted like a meeting of a peer writing group, students interact with the instructor and the rest of the seminar to discuss and receive feedback on their papers.

(*ALERT: FINAL RESEARCH PAPER IS DUE NEXT WEEK, BY 5 PM ON MAY 7, 2010!!!*)

Week 15: ORAL PRESENTATIONS ON TOPICS OF FINAL RESEARCH PAPERS

(*ALERT: FINAL RESEARCH PAPER IS DUE THIS WEEK, BY 5 PM ON MAY 7, 2010!!!*)

TUESDAY, MAY 4, 2010

FINAL ORAL PRESENTATIONS BY GROUP 1

THURSDAY, MAY 6, 2010 (LAST CLASS MEETING)

FINAL ORAL PRESENTATIONS BY GROUP 2

MAY 7, 2010: FINAL RESEARCH PAPERS DUE

**PLEASE SUBMIT PAPERS ON MAY 7, 2010 BY 5:00 PM, IN MY MAILBOX
(MEDICAL HISTORY & BIOETHICS DEPT., 1300 UNIV. AVE., 1ST FLOOR)**

