

SCIENCE IN AMERICA

History of Science/Medical History & Bioethics 394

Fall, 2007

- INSTRUCTOR:** Ronald L. Numbers
- OFFICE HOURS:** 10:00 - 11:00, Tues. & Thurs., 1432 MSC, 1300 University Ave.
- DESCRIPTION:** A survey from the colonial period to the present, with emphasis on the institutional growth of science and the ways in which science has influenced thought and life in America.
- TIME & PLACE:** 11:00 - 12:15, Tues. & Thurs., 1010 MSC, 1300 University Ave.
- FORMAT:** The course will consist of class discussions and presentations by the instructor.
- REQUIREMENTS:** All students are required to attend class, to read and discuss the assigned articles, to write a short research paper based on primary sources, to present their findings to the class, and to take a final examination. Undergraduate papers should not exceed 10 pages; graduate papers may be twice that long.
- READINGS:** The only required text for all students is Ronald L. Numbers and Charles E. Rosenberg, *The Scientific Enterprise in America: Readings from Isis* (Chicago: University of Chicago Press, 1996). Photocopies of the additional required readings will be available for purchase. Graduate students will, in addition, be required to read:
- Robert V. Bruce, *The Launching of Modern American Science, 1846-1876* (New York: Alfred A. Knopf, 1987).
- A. Hunter Dupree, *Science in the Federal Government: A History of Policies and Activities to 1940* (Cambridge, MA: Harvard University Press, 1957).
- Daniel J. Kevles, *The Physicists: A History of a Scientific Community in Modern America* (New York: Knopf, 1977).
- EVALUATION:** Students will be evaluated primarily on the basis of their papers and examinations, with attendance and participation in class playing a secondary role.

SCHEDULE

Sept. 4	Introduction
Sept. 6	Science in the Old World
Sept. 11	Colonial Science in the New World
Sept. 13	God and Nature
Sept. 18	No Class [schedule individual meetings]
Sept. 20	Useful Knowledge
Sept. 25	Cultivating Science
Sept. 27	Supporting Science
Oct. 2	Diffusing Science
Oct. 4	Genesis, Geology, and the Origin of the Solar System
Oct. 9	Ethnology and Evolution
Oct. 11	Medical Science before Scientific Medicine
Oct. 16	Scientific Medicine
Oct. 18	Science and Technology
Oct. 23	Science and Industry
Oct. 25	Science and the American University
Oct. 30	Darwinism Comes to America
Nov. 1	Evolution, Religion, and Scientific Naturalism
Nov. 6	Social Darwinism and Eugenics
Nov. 8	Creation and Evolution in the 1920s
Nov. 13	The Rise to World Scientific Power
Nov. 15	The Social and Behavioral Sciences
Nov. 20	World War II and the Bomb
Nov. 22	THANKSGIVING
Nov. 27	Cold War Science
Nov. 29	Big Science: The American Way?
Dec. 4	Science and Human Values
Dec. 6	The Morality of Science
Dec. 11	Science, Pseudo-Science, and Quackery
Dec. 13	Politics, Religion, and Science at the Turn of the Millennium

Reading Assignments

Science in the Old World:

I. Bernard Cohen, "The New World as a Source of Science for Europe," *Actes du IXe Congres International d'Histoire des Sciences* (Barcelona/Madrid, 1959), vol. 1, pp. 95-126.

Colonial Science in the New World:

Brooke Hindle, "The Natural History Circle," in *The Pursuit of Science in Revolutionary America, 1735-1789* (Chapel Hill: University of North Carolina Press, 1956), pp.11-35.

Joyce E. Chaplin, "Nature and Nation: Natural History in Context," in *Stuffing birds, Pressing Plants, Shaping Knowledge: Natural History in North America, 1730-1860* (Philadelphia: American Philosophical Society, 2003), pp. 75-95.

God and Nature:

Sara Schechner Genuth, "From Heaven's Alarm to Public Appeal: Comets and the Rise of Astronomy at Harvard," in *Science at Harvard University: Historical Perspectives*, ed. Clark A. Elliott and Margaret W. Rossiter (Bethlehem, Penn.: Lehigh University Press, 1992), pp. 28-54.

J. Rixey Ruffin, "'Urania's Dusky Vails': Heliocentrism in Colonial Almanacs, 1700-1735," *New England Quarterly* 70 (1997): 306-13.

David Levin, "Giants in the Earth: Science and the Occult in Cotton Mather's Letters to the Royal Society," *William and Mary Quarterly* 45 (1988): 751-70.

Useful Knowledge:

Maxine van de Wetering, "A Reconsideration of the Inoculation Controversy," *New England Quarterly* 58 (1985): 46-67.

I. Bernard Cohen, "Benjamin Franklin," in *Dictionary of Scientific Biography*, ed. Charles C. Gillespie, 18 vols. (New York: Scribners, 1970-1990), vol. 5, pp. 129-39.

Cultivating Science:

George H. Daniels, "The Process of Professionalization in American Science: The Emergent Period, 1820-1860," in *The Scientific Enterprise in America: Readings from Isis*, ed. Ronald L. Numbers and Charles E. Rosenberg (Chicago: University of Chicago Press, 1996), pp. 21-36.

Sally Gregory Kohlstedt, "Creating a Forum for Science: AAAS in the Nineteenth Century," in *The Establishment of Science in America: 150 Years of the American Association for the Advancement of Science*, by Kohlstedt, Michael M. Sokal, and Bruce V. Lewenstein (New Brunswick, N.J.: Rutgers University Press, 1999), pp. 7-39.

Supporting Science:

Hugh R. Sloten, "The Dilemmas of Science in the United States: Alexander Dallas Bache and the U.S. Coast Survey," in *The Scientific Enterprise in America: Readings from Isis*, ed. Ronald L. Numbers and Charles E. Rosenberg (Chicago: University of Chicago Press, 1996), pp. 37-60.

Stanley M. Guralnick, "Sources of Misconception on the Role of Science in the Nineteenth-Century American College," in *The Scientific Enterprise in America: Readings from Isis*, ed. Ronald L. Numbers and Charles E. Rosenberg (Chicago: University of Chicago Press, 1996), pp. 83-97.

Diffusing Science:

Sally Gregory Kohlstedt, "Parlors, Primers, and Public Schooling: Education for Science in Nineteenth-Century America," in *The Scientific Enterprise in America: Readings from Isis*, ed. Ronald L. Numbers and Charles E. Rosenberg (Chicago: University of Chicago Press, 1996), pp. 61-82.

Margaret W. Rossiter, "Benjamin Silliman and the Lowell Institute: The Popularization of Science in Nineteenth-Century America," *New England Quarterly* 44 (1971): 602-26.

Genesis, Geology, and the Origin of the Solar System:

Ronald L. Numbers, "Cosmogonies from 1700 to 1900," in *The History of Science and Religion in the Western Tradition: An Encyclopedia*, ed. Gary B. Ferngren and Others (New York: Garland, 2000), pp. 350-355.

James R. Moore, "Geologists and Interpreters of Genesis in the Nineteenth Century," in *God and Nature: Historical Essays on the Encounter between Christianity and Science*, ed. David C. Lindberg and Ronald L. Numbers (Berkeley and Los Angeles: University of California Press, 1986), pp. 322-50.

Ethnology and Evolution:

G. Blair Nelson, "'Men before Adam!': American Debates over the Unity and Antiquity of Humanity," in *When Science and Christianity Meet*, ed. Lindberg and Numbers (Chicago: University of Chicago Press, 2003), pp. 161-81.

Herbert Hovenkamp, "Coming from Nowhere," in *Science and Religion in America, 1800-1860* (Philadelphia: University of Pennsylvania Press, 1978), pp. 187-210, 262-64.

Medical Science before Scientific Medicine:

Gregg Mitman and Ronald L. Numbers, "From Miasma to Asthma: The Changing Fortunes of Medical Geography in America," *History and Philosophy of the Life Sciences* 25 (2003): 391-412.

Stephanie Browner, "Ideologies of the Anesthetic: Professionalism, Egalitarianism and the Ether Controversy," *American Quarterly* 51 (1999): 108-43.

Scientific Medicine

Bert Hansen, "New Images of a New Medicine: Visual Evidence for Widespread Popularity of Therapeutic Discoveries in America after 1885," *Bulletin of the History of Medicine* 73 (1999): 629-678.

Nancy Tomes, "The Private Side of Public Health: Sanitary Science, Domestic Hygiene, and the Germ Theory, 1870-1900," *Bulletin of the History of Medicine* 64 (1990): 509-39.

Science and Technology:

Iwan R. Morus, "Telegraphy and the Technology of Display: The Electricians and Samuel Morse," *History of Technology* 13 (1991): 20-40.

Paul Lucier, "Commercial Interests and Scientific Disinterestedness: Consulting Geologists in Antebellum America," *Isis* 86 (1995): 245-67.

Science and Industry:

Ronald Kline, "Construing 'Technology' as 'Applied Science': Public Rhetoric of Scientists and Engineers in the United States, 1880-1945," *Isis* 86 (1995): 194-221.

George Wise, "Ionists in Industry: Physical Chemistry at General Electric, 1900-1915," in *The Scientific Enterprise in America: Readings from Isis*, ed. Ronald L. Numbers and Charles E. Rosenberg (Chicago: University of Chicago Press, 1996), pp.187-202.

Science and the American University:

George H. Daniels, "The Pure-Science Ideal and Democratic Culture," *Science* 156 (1967): 1699-1705.

Robert E. Kohler, "The Ph.D. Machine: Building on the Collegiate Base," in *The Scientific Enterprise in America: Readings from Isis*, ed. Ronald L. Numbers and Charles E. Rosenberg (Chicago: University of Chicago Press, 1996), pp. 98-122.

Margaret W. Rossiter, "'Women's Work' in Science, 1880-1910," in *The Scientific Enterprise in America: Readings from Isis*, ed. Ronald L. Numbers and Charles E. Rosenberg (Chicago: University of Chicago Press, 1996), pp. 123-40.

Darwinism Comes to America:

Ronald L. Numbers, "Darwinism and the Dogma of Separate Creations: The Responses of American Naturalists to Evolution," in *Darwinism Comes to America*, by Ronald L. Numbers (Cambridge, Mass.: Harvard University Press, 1998), pp. 24-48, 166-78.

Eric D. Anderson, "Black Responses to Darwinism, 1859-1915," in *Disseminating Darwinism: The Role of Place, Race, Religion and Gender*, ed. Ronald L. Numbers and John Stenhouse (Cambridge: Cambridge University Press, 1999), pp. 247-66.

Evolution, Religion, and Scientific Naturalism:

Jon H. Roberts, "Darwinism, American Protestant Thinkers, and the Puzzle of Motivation," in *Disseminating Darwinism: The Role of Place, Race, Religion and Gender*, ed. Ronald L. Numbers and John Stenhouse (Cambridge: Cambridge University Press, 1999), pp. 145-72.

David N. Livingstone and Mark A. Noll, "B. B. Warfield (1851-1921): A Biblical Inerrantist as Evolutionist," *Isis* 91 (2000): 283-304.

Social Darwinism and Eugenics:

Irvin G. Wyllie, "Social Darwinism and the Businessman," *Proceedings of the American Philosophical Society* 103 (1959): 629-35.

Charles E. Rosenberg, "Charles Benedict Davenport and the Irony of American Eugenics," in *No Other Gods: On Science and American Social Thought* (Baltimore: Johns Hopkins University Press, 1976), pp. 89-97.

Edward J. Larson, "Belated Progress: The Enactment of Eugenic Legislation in Georgia," *Journal of the History of Medicine and Allied Sciences* 46 (1991): 44-64.

Creation and Evolution in the 1920s:

Ronald L. Numbers, "The Scopes Trial: History and Legend," in *Darwinism Comes to America* (Cambridge, Mass.: Harvard University Press, 1998), pp. 76-91, 187-92.

Constance Areson Clark, "Evolution for John Doe: Pictures, the Public, and the Scopes Trial Debate," *Journal of American History* 87 (2001): 1275-1303.

Jeffrey P. Moran, "Reading Race into the Scopes Trial: African American Elites, Science, and Fundamentalism," *Journal of American History* (2003): 891-911.

The Rise to World Scientific Power:

Charles E. Rosenberg, "The Social Environment of Scientific Innovation: Factors in the Development of Genetics in the United States," in *No Other Gods: On Science and American Social Thought* (Baltimore: Johns Hopkins University Press, 1976), pp. 196-209.

John W. Servos, "Mathematics and the Physical Sciences in America, 1880-1930," in *The Scientific Enterprise in America: Readings from Isis*, ed. Ronald L. Numbers and Charles E. Rosenberg (Chicago: University of Chicago Press, 1996), pp.141-59.

Larry Owens, "MIT and the Federal 'Angel': Academic R & D and Federal-Private Cooperation before World War II," in *The Scientific Enterprise in America: Readings from Isis*, ed. Ronald L. Numbers and Charles E. Rosenberg (Chicago: University of Chicago Press, 1996), pp. 247-72.

The Social and Behavioral Sciences:

Claudia Roth Pierpont, "The Measure of America: How a Rebel Anthropologist Waged War on Racism," *New Yorker*, March 8, 2004, pp. 48-63.

Jon H. Roberts, "Psychoanalysis and American Christianity, 1900-1945," in *When Science and Christianity Meet*, ed. Lindberg and Numbers (Chicago: University of Chicago Press, 2003), pp. 225-44.

World War II and the Bomb:

Stanley Goldberg, "Inventing a Climate of Opinion: Vannevar Bush and the Decision to Build the Bomb," in *The Scientific Enterprise in America: Readings from Isis*, ed. Ronald L. Numbers and Charles E. Rosenberg (Chicago: University of Chicago Press, 1996), pp.273-96.

Daniel J. Kevles, "The Bomb and Postwar Research Policy," in *The Physicists: A History of a Scientific Community in Modern America* (New York: Knopf, 1977), pp. 324-48.

Cold War Science:

Daniel J. Kevles, "The National Science Foundation and the Debate over Postwar Research Policy, 1942-1945: A Political Interpretation of 'Science--The Endless Frontier,'" in *The Scientific Enterprise in America: Readings from Isis*, ed. Ronald L. Numbers and Charles E. Rosenberg (Chicago: University of Chicago Press, 1996), pp. 297-319.

David A. Hollinger, "Science as a Weapon in Kulturkämpfe in the United States during and after World War II," in *The Scientific Enterprise in America: Readings from Isis*, ed. Ronald L. Numbers and Charles E. Rosenberg (Chicago: University of Chicago Press, 1996), pp., pp. 320-34.

Big Science: The American Way?

Robert W. Smith, "The Biggest Kind of Big Science: Astronomers and the Space Telescope," in *Big Science: The Growth of Large-Scale Research*, ed. Peter Galison and Bruce Hevly (Stanford, CA: Stanford University Press, 1992), pp. 184-211.

Daniel Kevles, "Big Science and Big Politics in the United States: Reflections on the Death of the SSC and the Life of the Human Genome Project," *Historical Studies in the Physical and Biological Sciences* 27 (1997): 269-98.

Science and Human Values:

James H. Jones, "Annals of Sexology: Dr. Yes," *New Yorker*, August 25-September 1, 1997, pp. 98-113.

Allan M. Brandt, "Racism and Research: The Case of the Tuskegee Syphilis Study," *Hastings Center Report* 8 (No. 6, 1978): 21-29.

The Morality of Science:

David A. Hollinger, "Inquiry and Uplift: Late Nineteenth-Century American Academics and the Moral Efficacy of Scientific Practice," in *The Authority of Experts: Studies in History and Theory*, ed. Thomas L. Haskell (Bloomington: Indiana University Press, 1984), pp. 142-56.

Susan E. Lederer, "Political Animals: The Shaping of Biomedical Research Literature in Twentieth-Century America," in *The Scientific Enterprise in America: Readings from Isis*, ed. Ronald L. Numbers and Charles E. Rosenberg (Chicago: University of Chicago Press, 1996), pp. 228-46.

Science, Pseudo-Science, and Quackery:

Thomas F. Gieryn, "Boundary-Work and the Demarcation of Science from Non-Science: Strains and Interests in Professional Ideologies of Scientists," *American Sociological Review* 48 (1983): 781-795.

Deborah J. Coon, "Testing the Limits of Sense and Science: American Experimental Psychologists Combat Spiritualism, 1880-1920," *American Psychologist* 47 (1992): 143-51.

Steven C. Martin, "'The Only Truly Scientific Method of Healing': Chiropractic and American Science, 1895-1990," *Isis* 85 (1994): 207-27.

Ronald L. Numbers, "Creationism in 20th-Century America," *Science* 218 (1982): 538-544.

Politics, Religion, and Science at the Turn of the Millennium:

Jane Maineschein, in "Hopes and Hypes for Stem Cells," in *Whose View of Life? Embryos, Cloning, and Stem Cells* (Cambridge, Mass.: Harvard University Press, 2003), pp. 248-97.

Chris Mooney, "Bush League Science," in *The Republican War on Science* (New York: Basic Books, 2005), pp. 224-47.

Jim Holt, "Madness about a Method: How Did Science Become So Contentious and Politicized?" *New York Times Magazine*, December 11, 2005, pp. 25, 28.

Margaret Talbot, "Darwin in the Dock: Intelligent Design Has Its Day in Court," *New Yorker*, December 5, 2005, pp. 66-77.