

**History of Science 615: History of Evolutionary Thought
Philosophy 523: Philosophy of Biology – Darwin and Darwinism**

Ronald Numbers and Elliott Sober

Fall 2008

Time: Tuesdays & Thursdays, 1:00-2:15 p.m.

Place: Van Vleck B113

Requirements: Attend all classes, do the readings, and participate in discussions. There will be two 5-page papers and two examinations.. Your exams may be oral or written, your choice. The papers will be on one historical topic and on one philosophical topic.

September 25: First examination

October 21: First paper due

November 18: Second examination

December 11: Second paper due

Office hours: RN's office is in 1432 Medical Sciences Center (1300 University Ave.), and his office hours are 10:00-11:00 Tuesdays and Thursdays or by appointment. ES's office is in 5199 Helen C. White Hall, and his office hours are Wednesday 1:30-3:30 or by appointment.

Books available at University Bookstore:

Philip Appleman, ed., *Darwin: A Norton Critical Edition*, 3rd ed. (New York: W. W. Norton, 2001).

Adrian Desmond, James Moore, and Janet Browne, *Charles Darwin* (Oxford: Oxford University Press, 2007).

Jonathan Hodge and Gregory Radick, eds., *The Cambridge Companion to Darwin* (Cambridge: Cambridge University Press, 2003).

Edward J. Larson, *Evolution: The Remarkable History of a Scientific Theory* (New York: Modern Library, 2004).

EVOLUTION BEFORE DARWIN

September 2 (RN): The origin of the concept of science and its methods (e.g., the move from natural philosophy to science, the importance of naturalism, and the alleged significance of Baconianism). Natural theology before Darwin (e.g., the argument from design, the doctrine of providence, and the importance of natural theology for pre-Darwinian biologists).

Readings:

Ronald L. Numbers, "Science without God: Natural Laws and Christian Beliefs," in *When Science and Christianity Meet*, ed. David C. Lindberg and Ronald L. Numbers (University of Chicago Press, 2003), pp. 265-85.

William Paley, "Natural Theology," in Appleman, *Darwin*, pp. 41-44.

John Herschel, "The Study of Natural Philosophy," in Appleman, *Darwin*, pp. 52-57.

William Whewell, "Astronomy and General Physics Considered with Reference to Natural Theology," in Appleman, *Darwin*, pp. 57-61.

September 4 (RN): Genesis and geology before Darwin. Constructing the geological column and adjusting Genesis to the evidence for the antiquity and progress of life. Uniformitarianism and catastrophism. The nebular hypothesis.

Readings:

Larson, *Evolution*, pp. 5-51.

Charles Lyell, "Principles of Geology," Appleman, *Darwin*, pp. 49-52.

September 9 (RN): Early evolutionary theories. The origin and antiquity of humans. The polygenist-monogenist debates. Evidence for human antiquity.

Readings:

Larson, *Evolution*, pp. 133-50.

G. Blair Nelson, "'Men before Adam!': American Debates over the Unity and Antiquity of Humanity," in *When Science and Christianity Meet*, ed. David C. Lindberg and Ronald L. Numbers (University of Chicago Press, 2003), pp. 161-82.

Nicolaas A. Rupke, "The Origin of Species from Linnaeus to Darwin," in *Aurora Torealis: Studies in the History of Science and Ideas in Honor of Tore Frängsmyr*, ed. Marco Beretta, Karl Grandin, and Svante Lindqvist (Sagamore Beach, Mass.: Science History Publications, 2008), pp. 71-85

Jean Baptiste Lamarck, "Zoological Philosophy," in Appleman, *Darwin*, pp. 44-49.

September 11-16 (ES): The design argument: Hume's critique in DCNR; Paley's formulation. What is the strongest representation of the argument? Inductivist versus Bayesian representations. An introduction to Bayesianism.

Readings:

David Hume, *Dialogues Concerning Natural Religion*, 1776. Available at:
<http://www.anselm.edu/homepage/dbanach/dnr.htm>

William Paley, The Watch on the Heath, and Paley's Replies to Objections.

William Whewell, Excerpt from *Astronomy and General Physics Considered with Reference to Natural Theology*, in Appleman, *Darwin*, pp. 57-61.

Elliott Sober, "Introduction to Bayesian Epistemology" at
<http://philosophy.wisc.edu/sober/courses.html>

Elliott Sober, "The Design Argument," at
<http://philosophy.wisc.edu/sober/recent.html>

Darwin

September 18 (RN): Charles Darwin to 1859

Readings:

Larson, *Evolution*, pp. 55-75.

Desmond, Moore, and Browne, *Charles Darwin*, pp. 1-68.

Charles Darwin, "The Voyage of the *Beagle*," in Appleman, *Darwin*, pp. 67-81.

Charles Darwin, "On the Tendency of Species to Form Varieties," in Appleman, *Darwin*, pp. 82-94.

Alfred Russel Wallace, "On the Tendency of Varieties to Depart Indefinitely from the Original Type," in Appleman, *Darwin*, pp. 61-64.

Optional Additional Readings:

Philip R. Sloan, "The Making of a Philosophical Naturalist," in Hodge and Radick, *Cambridge Companion to Darwin*, pp. 17-39.

Jonathan Hodge, "The Notebook Programmes and Projects of Darwin's London Years," in Hodge and Radick, *Cambridge Companion to Darwin*, pp.40-68.

September 23 (RN): Charles Darwin after 1859

Readings:

Desmond, Moore, and Browne, *Charles Darwin*, pp 69-124.

September 25: First Examination

September 30, October 2, 7 (ES): *The Origin*. The structure of Darwin's theory and how it differs from previous evolutionary theories; the meaning of key concepts such as natural selection, chance, fitness; the argumentative organization of the *Origin*; the nature of Darwin's evidence for common ancestry and for natural selection.

Readings:

Charles Darwin, "The Origin of Species," in Appleman, *Darwin*, pp. 95-174.

Kenneth Waters, "The Arguments in the Origin of Species," in Hodge and Radick, *Cambridge Companion to Darwin*, pp. 116-143.

Greg Radick, "Is the theory of natural selection independent of its history?" in Hodge and Radick, *Cambridge Companion to Darwin*, pp. 143-167.

M. J. S. Hodge, "Natural Selection as a Causal, Empirical, and Probabilistic Theory," in *The Probabilistic Revolution*, ed. L. Kruger, G. Gigerenzer, and M. Morgan (Cambridge, Mass.: MIT Press, 1987), vol. 2, pp. 233-270

Philip Kitcher, "Darwin's Achievement,," in *In Mendel's Mirror* (Oxford UP, 2005), pp. 45-93.

October 9, 14 (ES): *Descent of Man*. Darwin on differences among human beings (e.g., the sexes, the races). The origins of religion and morality. Darwin on natural selection for the good of the individual and/or the good of the group. Sexual versus natural selection.

Readings:

Charles Darwin, "The Descent of Man," in Appleman, *Darwin*, pp. 175-54.

Robert Richards, "Darwin on Mind, Morals, and Emotions," in Hodge and Radick, *Cambridge Companion to Darwin*, pp. 92-116.

Jim Endersby, "Darwin on Generation, Pangenesis, and Sexual Selection," in Hodge and Radick, *Cambridge Companion to Darwin*, pp. 69-91.

Michael Ruse, "Charles Darwin and Group Selection," *Annals of Science* 37 (1980): 615-630.

Peter Kropotkin, "Mutual Aid," in Appleman, *Darwin*, pp. 398-403.

Martin Nowak, Robert May, and Karl Sigmund, "The Arithmetic of Mutual Help," in Appleman, *Darwin*, pp. 403-408

October 16 (RN): Scientific responses to Darwin

Readings:

Larson, *Evolution*, pp.80-129.

Appleman, *Darwin*, pp. 257-88.

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.

October 21: Janet Browne

October 23 (RN): Religious responses to Darwinism.

Readings:

John Hedley Brooke, "Darwin and Victorian Christianity," in Hodge and Radick, *Cambridge Companion to Darwin*, pp. 192-213..

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.

October 28 (ES): Nineteenth Century Philosophical Responses to Darwinism (Herschel, Whewell, Mill, Peirce, Spencer)

Readings:

David Hull, "Darwin's Science and Victorian Philosophy of Science," in Hodge and Radick, *Cambridge Companion to Darwin*, pp. 168-192.

C.S. Peirce, "The Fixation of Belief," *Popular Scientific Monthly*, 1877, 12:1-15.
Available at: <http://www.peirce.org/writings/p107.html>

October 30 (RN): Geographical differences in the reception of Darwinism.

Readings:

David N. Livingstone, "Science, Region, and Religion: The Reception of Darwinism in Princeton, Belfast, and Edinburgh," in *Disseminating Darwinism: The Role of Place, Race, Religion, and Gender*, ed. Ronald L. Numbers and John Stenhouse (Cambridge: Cambridge University Press, 1999), pp. 7-38.

Pietro Corsi and Paul J. Weindling, "Darwinism in Germany, France and Italy," in *The Darwinian Heritage*, ed. David Kohn (Princeton, N.J.: Princeton University Press, 1985), pp. 683-729.

Post Darwin

November 4 (RN): Social Darwinism and Eugenics

Readings:

Larson, *Evolution*, pp. 153-97.

Richard Hofstadter, "The Vogue of Spencer," in Appleman, *Darwin*, pp. 389-95.

Andrew Carnegie, "The Gospel of Wealth," in Appleman, *Darwin*, pp. 396-398.

Diane B. Paul, "Darwin, Social Darwinism, and Eugenics," in *The Cambridge Companion to Darwin*, ed. Jonathan Hodge and Gregory Radick (Cambridge: Cambridge University Press, 2003), pp. 214-39

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

November 6 (ES): Sociobiology, and critiques thereof.

Readings:

E.O. Wilson, Excerpt from *Sociobiology – the New Synthesis*, in Appleman, *Darwin*, pp. 409-415.

Stephen Jay Gould, "Biological Potentiality vs. Biological Determinism," in Appleman, *Darwin*, pp. 415-420.

Gould, S. and Lewontin, R. (1979): "The Spandrels of San Marco and the Panglossian Paradigm – A Critique of the Adaptationist Paradigm." *Proceedings of the Royal Society B* 205: 581-598.

Science for the People (1976): "Sociobiology – Another Biological Determinism." *Bioscience* 26: 182-186.

November 11 (ES): Evolution and ethics. Hume's is/ought thesis – the descriptive/normative distinction, metaethics.

Readings:

Thomas Henry Huxley, Selection from *Evolution and Ethics*, in Appleman, *Darwin*, pp. 501-503.

Frans de Waal, Excerpt from *Good Natured*. Appleman, *Darwin*, pp. 511-517.

Matt Ridley, Excerpt from *The Origins of Virtue*. Appleman, *Darwin*, pp. 517-525.

Michael Ruse and E.O. Wilson, "The Evolution of Ethics" in Appleman, *Darwin*, pp. 507-11.

Philip Kitcher, "Five Ways to Biologize Ethics." In E. Sober, *Conceptual Issues in Evolutionary Biology*, MIT Press, pp. xxx-xxx.

November 13 (RN): The Anti-Evolution Movement (the 1920s and the Scopes trial)

Readings:

Larson, *Evolution*, pp.201-18.

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

William Jennings Bryan, "God and Evolution," *New York Times*, February 26, 1922; Henry Fairfield Osborn, "Evolution and Religion," *ibid.*, March 5, 1922; Edwin Grant Conklin, "Bryan and Evolution," *ibid.*, March 5, 1922.

"The Scopes Trial," in Appleman, *Darwin*, pp. 542-49.

November 18: Second examination. Evening showing of "Inherit the Wind."

November 20 (RN): The Creationist Revival (e.g., BSCS texts, Sputnik, *Genesis Flood*, CRS)

Readings:

Larson, *Evolution*, pp. 247-63.

Henry M. Morris, "Scientific Creationism," in Appleman, *Darwin*, pp. 557-64.

“Scientists’ Opposition to Creationism,” in Appleman, *Darwin*, pp. 613-23.

Ronald L. Numbers, "The Creationists," 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. 391-423.

November 25 (RN): Intelligent Design

Readings:

Ronald L. Numbers, “Intelligent Design” in *The Creationists: From Scientific Creationism to Intelligent Design*, expanded ed. (Cambridge, Mass.: Harvard University Press, 2006), pp. 373-98.

Phillip E. Johnson, “Darwin on Trial,” in Appleman, *Darwin*, pp. 581-86.

Michael Behe, “Darwin’s Black Box,” in Appleman, *Darwin*, pp. 592-601.

Michael Ruse, “Darwin’s New Critics on Trial,” in Appleman, *Darwin*, pp. 605-12.

November 27: THANKSGIVING

December 2-4-9 (ES): Creationism, ID, and the definition of science (The Demarcation Problem, Popper’s falsifiability criterion. Metaphysical and methodological naturalism).

Readings:

Michael Ruse, “Witness Testimony Sheet, McLean v. Arkansas,” in *But Is It Science? The Philosophical Question in the Creation/Evolution Controversy*, ed. Michael Ruse (Buffalo, N.Y.: Prometheus Books, 1988), pp.287-306.

William Overton, “United States District Court Opinion, McLean v. Arkansas,” in *But Is It Science? The Philosophical Question in the Creation/Evolution Controversy*, ed. Michael Ruse (Buffalo, N.Y.: Prometheus Books, 1988), pp. 307-335.

Larry Laudan, “The Demise of the Demarcation Problem,” in *But Is It Science? The Philosophical Question in the Creation/Evolution Controversy*, ed. Michael Ruse (Buffalo, N.Y.: Prometheus Books, 1988), pp. 337-351.

C.G. Hempel, “Empiricist Criteria of Cognitive Significance – Problems and Changes,” in *Aspects of Scientific Explanation and Other Essays* (New York: Free Press, 1965), pp. 99-122

Robert Pennock and Steven Fuller, testimony at Kitzmiller v. Dover Area School District.
At http://www.talkorigins.org/faqs/dover/kitzmiller_v_dover.html

December 11(ES): Darwin's relation to present day biology.

Readings:

Jean Gayon, "From Darwin to Today in Evolutionary Biology," in Hodge and Radick, *Cambridge Companion to Darwin*, pp. 240-266.

Larson, *Evolution*, pp. 221-43, "The Modern Synthesis"; 267-86, "Postmodern Developments," e.g., DNA, Wilson, Gould

Peter Bowler, "The Neo-Darwinian Synthesis," in Appleman, *Darwin*, pp. 319-25.