

Biology and History of Human Evolution
(Zoology 400/History of Science 615)

Ronald L. Numbers (History of Science) and Karen L. Steudel (Zoology)

1:00 – 3:00 p.m. Monday, 163 Noland Hall

This seminar-style class will explore the history of knowledge about human evolution, starting with early 19th-century views on the origin and antiquity of human races before moving on to Charles Darwin's work on human evolution, especially his *Descent of Man* (1871). It will then consider the discovery of the human fossil record, focusing on the nature of the specimens found and the scientific interpretation of their implications. The class will also explore the dissemination of information about these discoveries, as well as the religious and social controversies sparked by the claims of ape-like ancestors. Students will be required to read and discuss key primary and secondary sources associated with the history of human evolution and to write one or more papers.

Required readings:

Thomas H. Huxley, *Man's Place in Nature* (New York: Appleton, 1863; rept. Dover, 2003).

Charles Darwin, *The Descent of Man*, 2nd ed., with an introduction by Adrian Desmond and James Moore (London: John Murray, 1879; rept. Penguin Classics, 2004).

Roger Lewin, *Bones of Contention: Controversies in the Search for Human Origins*, 2nd ed. (Chicago: University of Chicago Press, 1997).

J. S. Weiner, *The Piltdown Forgery* (New York: Oxford University Press, 2004).

New Look at Human Evolution, a special edition of *Scientific American* (May 2003).

Recommended reading:

Peter J. Bowler, *Theories of Human Evolution: A Century of Debate, 1844-1944* (Baltimore: Johns Hopkins University Press, 1987).

Assignments:

Jan. 25: The Origin of Human Races

Required:

*J. C. Nott and George R. Gliddon, *Types of Mankind; or, Ethnological Researches Based upon the Ancient Monuments, Paintings, Sculptures, and Crania or Races, and upon Their Natural, Geographical, Philological, and Biblical History* (Philadelphia: Lippincott, Grambo, 1854). Skim.

*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 (Chicago: University of Chicago Press, 2003), pp. 161-81.

*David N. Livingstone, “Apologetics: Pre-Adamism and the Harmony of Science and Religion,” in *Adam’s Ancestors: Race, Religion, and the Politics of Human Origins* (Baltimore: Johns Hopkins University Press, 2008), pp. 80-108.

Recommended:

William Stanton, *The Leopard’s Spots: Scientific Attitudes toward Race in America, 1815-59* (Chicago: University of Chicago Press, 1960).

Stephen Jay Gould “Morton’s Ranking of Races by Cranial Capacity: Unconscious Manipulation of Data May Be a Scientific Norm,” *Science* 200 (1978): 503-509; reprinted as “American Polygeny and Craniometry before Darwin,” in *The Mismeasure of Man* (New York: W. W. Norton, 1981), pp. 30-72.

Bruce Dain, *A Hideous Monster of the Mind: American Race Theory in the Early Republic* (Cambridge, Mass.: Harvard University Press, 2002).

Robert Kenny, “From the Curse of Ham to the Curse of Nature: The Influence of Natural Selection on the Debate on Human Unity before the publication of the *Descent of Man*,” *British Journal for the History of Science* 40 (2007): 367-88.

Feb. 1: Discovering Human Antiquity

Required:

Thomas H. Huxley, *Man’s Place in Nature* (New York: Appleton, 1863; rept. Dover, 2003).

*A. Bowdoin Van Riper, "The Public Debate over Human Antiquity: 1859-1875," in *Men among the Mammoths: Victorian Science and the Discovery of Human Prehistory* (Chicago: University of Chicago Press, 1993), pp. 144-83.

*Thomas R. Trautmann, "The Revolution in Ethnological Time," *Man*, New Ser., 27 (1992): 379-397.

Recommended:

*Michael Bartholomew, "Lyell and Evolution: An Account of Lyell's Response to the Prospect of an Evolutionary Ancestry for Man," *British Journal for the History of Science* 6 (1973): 261-303.

*W. F. Bynum, "Charles Lyell's 'Antiquity of Man' and Its Critics," *Journal of the History of Biology* 17 (1984): 153-187.

Claudine Cohen and Jean-Jacques Hublin, *Boucher de Perthes, 1788-1868: Les origines romantiques de la préhistoire* (Paris: Belin, 1989).

Claudine Cohen, *L'homme des origines: Savoirs et fictions en préhistoire* (Paris: Editions du Seuil, 1999).

*Claudine Cohen, "Charles Lyell and the Evidences of the Antiquity of Man," in *Lyell: The Past Is the Key to the Present*, ed. Derek J. Blundell and Andrew C. Scott, Geological Society (London), Special Publication 143 (1998): 83-93.

Adrian Desmond, *Huxley: From Devil's Disciple to Evolution's High Priest* (Reading, MA: Addison-Wesley, 1997).

Mario A. di Gregorio, *T. H. Huxley's Place in Natural Science* (New Haven: Yale University Press, 1984).

Neal C. Gillespie, "The Duke of Argyll, Evolutionary Anthropology, and the Art of Scientific Controversy," *Isis* 68 (1977): 40-54.

Donald K. Grayson, *The Establishment of Human Antiquity* (New York: Academic Press, 1983).

*Donald K. Grayson, "The First Three Editions of Charles Lyell's *The Geological Evidences of the Antiquity of Man*," *Archives of Natural History* 13 (1985):105-21.

*John Lyon, "The Search for Fossil Man: Cinq Personnages à la Recherche du Temps Perdu," *Isis* 61 (1970): 68-84.

Sherrie L. Lyons, "Convincing Men They Are Monkeys," in *Thomas Henry Huxley's Place in Science and Letters*, ed. Alan P. Barr (Athens: University of Georgia Press, 1997), pp. 95-118.

*Ronald L. Numbers, "'The Most Important Biblical Discovery of Our Time': William Henry Green and the Demise of Ussher's Chronology," *Church History* 69 (2000): 257-76.

James G. Paradis, *T. H. Huxley: Man's Place in Nature* (Lincoln: University of Nebraska Press, 1978).

*Leonard G. Wilson, "The Gorilla and the Question of Human Origins: The Brain Controversy," *Journal of the History of Medicine and Allied Sciences* 51 (1996): 184-207.

Feb. 8: Darwin and *The Descent of Man*

Required:

Charles Darwin, *The Descent of Man*, 2nd ed. (London: John Murray, 1879; rept. Penguin Books, 2004), with an introduction by James Moore and Adrian Desmond, introduction, chapters 1-6, 21.

Recommended:

Stephen G. Alter, "Race, Language, and Mental Evolution in Darwin's *Descent of Man*," *Journal of the History of the Behavioral Sciences* 43 (2007): 239-55.

Carl J. Bajema, "Charles Darwin on Man in the First Edition of the *Origin of Species*," *Journal of the History of Biology* 21 (1988): 403-10; Peter J. Bowler, "Darwin on Man in the *Origin of Species*: A Reply to Carl Bajema," *ibid.* 22 (1989): 497-500; Kathy J. Cooke, "Darwin on Man in the *Origin of Species*: An Addendum to the Bajema-Bowler Debate," *ibid.*, 23 (1989): 517-21.

Nelio Marco Vincenzo Bizzo, "Darwin on Man in the *Origin of Species*: Further Factors Considered," *Journal of the History of Biology* 25 (1992): 137-47.

*Janet Browne, "Son of a Monkey," in *Charles Darwin: The Power of Place, Volume II of a Biography* (New York: Knopf, 2002), pp. 325-69.

John R. Durant, "The Ascent of Nature in Darwin's *Descent of Man*," in *The Darwinian Heritage*, ed. David Kohn (Princeton, N.J.: Princeton University Press, 1985), pp. 283-306.

Sandra Herbert, "The Place of Man in the Development of Darwin's Theory of Transmutation," *Journal of the History of Biology* 7 (1974): 217-58; 10 (1977): 155-227.

*Greta Jones, "The Social History of Darwin's *Descent of Man*," *Economy and Society* 7 (1978): 1-23.

*Robert T. Pennock, "Moral Darwinism: Ethical Evidence for the Descent of Man," *Biology and Philosophy* 10 (1995): 287-307.

Robert J. Richards, *Darwin and the Emergence of Evolutionary Theories of Mind and Behavior* (Chicago: University of Chicago Press, 1987).

*Robert J. Richards, "Darwin on Mind, Morals and Emotions," in *The Cambridge Companion to Darwin*, ed. Jonathan Hodge and Gregory Radick (Cambridge: Cambridge University Press, 2003), pp. 92-115.

Feb. 15: Responses to Darwin

Required:

*Alfred Russel Wallace, "The Limits of Natural Selection as Applied to Man," in *Contributions to the Theory of Natural Selection: A Series of Essays*, by Alfred Russel Wallace, 2nd ed. (New York: Macmillan, 1871).

*Martin Fichman, "Science in Theistic Contexts: A Case Study of Alfred Russel Wallace on Human Evolution," *Osiris*, 2nd Ser., 16 (2001): 227-250.

*Ronald L. Numbers, "George Frederick Wright," *Isis* 79 (1988): 624-45.

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.

R. Scott Appleby, "Exposing Darwin's 'Hidden Agenda': Roman Catholic Responses to Evolution, 1875-1925," in *Disseminating Darwinism: The Role of Place, Race, Religion and Gender*, ed. Ronald L. Numbers and John Stenhouse (Cambridge: Cambridge University Press, 1999), pp. 173-207.

Recommended:

Mariano Artigas, Thomas F. Glick, and Rafael A. Martinez, *Negotiating Darwin: The Vatican Confronts Evolution, 1877-1902* (Baltimore: Johns Hopkins University Press, 2006).

Alvar Ellegård, "The Descent of Man," *Darwin and the General Reader: The Reception of Darwin's Theory of Evolution in the British Periodical Press, 1859-1872* (Göteborg: Elanders Boktryckeri Aktiebolag, 1958), pp. 293-331.

*Malcolm Jay Kottler, "Alfred Russel Wallace, the Origin of Man, and Spiritualism," *Isis* 65 (1974): 145-192.

Jon H. Roberts, *Darwinism and the Divine in America: Protestant Intellectuals and Organic Evolution, 1859-1900* (Madison: University of Wisconsin Press, 1988).

*Joel S. Schwartz, "Darwin, Wallace, and the 'Descent of Man,'" *Journal of the History of Biology* 17 (1984): 271-289.

*Roger Smith, "Alfred Russel Wallace: Philosophy of Nature and Man," *British Journal for the History of Science* 6 (1972): 177-199.

Feb. 22: Neanderthals

Required:

Paul Jordan, *Neanderthal: Neanderthal Man and the Story of Human Origins* (Phoenix Mill, Gloucestershire: Sutton, 1999), pp. 1-27.

*Judith C. Berman, "Bad Hair Days in the Paleolithic: Modern (Re)Constructions of the Cave Man," *American Anthropologist*, New Ser., 101 (1999): 288-304.

*Michael Hammond, "The Expulsion of the Neanderthals from Human Ancestry: Marcellin Boule and the Social Context of Scientific Research," *Social Studies of Science* 12 (1982): 1-36.

*Stephanie Moser, "The Visual Language of Archaeology: A Case Study of the Neanderthals," *Antiquity* 66 (1992): 831-44.

Recommended:

Peter J. Bowler, "The Geography of Extinction: Biogeography and the Expulsion of 'Ape Men' from Human Ancestry in the Early Twentieth Century," in *Ape, Man, Ape Man: Changing Views since 1600*, ed. Raymond Corbey and Bert Theunissen (Department of Prehistory, Leiden University, 1995), 185-93.

Stephanie Moser, *Ancestral Images: The Iconography of Human Origins* (Ithaca, N.Y.: Cornell University Press, 1998).

Erik Trinkaus and Pat Shipman, *The Neandertals: Changing the Image of Mankind* (London: Jonathan Cape, 1993).

Mar. 1: Java Man and Evidences of Humanity

Required:

*Bert Theunissen, *Eugène Dubois and the Ape-Man from Java: The History of the First "Missing Link" and Its Discoverer* (Dordrecht: Kluwer, 1989), pp. 22-58.

Stephen Jay Gould, "Men of the Thirty-Third Division," *Natural History* 99 (April 1990): 12-20; rept. in Gould, *Eight Little Piggies* (New York: W. W. Norton, 1993), pp. 124-37.

Carl C. Swisher III, Garniss H. Curtis, and Roger Lewin, *Java Man: How Two Geologists Changed Our Understanding of Human Evolution* (Chicago: University of Chicago Press, 2000), pp. 49-80.

Recommended:

Pat Shipman, *The Man Who Found the Missing Link: Eugène Dubois and His Lifelong Quest to Prove Darwin Right* (New York: Simon & Schuster, 2001). Semi-fictional.

G. H. R. von Koenigswald, *Meeting Prehistoric Man*, trans. Michael Bullock (New York: Harper & Brothers, 1956).

Mar. 8: The Piltdown Controversy

Required:

J. S. Weiner, *The Piltdown Forgery* (New York: Oxford University Press, 2004).

*William King Gregory, "The Dawn Man of Piltdown, England," *American Museum Journal* 14 (1914): 188-200.

*Henry Gee, "Box of Bones 'Clinches' Identity of Piltdown Paleontology Hoaxer," *Nature* 381 (1996): 261-62.

Recommended:

Peter Costello, "The Piltdown Hoax Reconsidered," *Antiquity* 49 (1985): 167-73.

*Stephen Jay Gould, "Piltdown Revisited" in *The Panda's Thumb: More Reflections in Natural History* (New York: W. W. Norton, 1980), pp. 108-24.

*Stephen Jay Gould, "The Piltdown Conspiracy" and "A Reply to Critics," in *Hen's Teeth and Horse's Toes* (New York: W. W. Norton, 1983), pp. 201-40.

*Murray Goulden, "Bringing Bones to Life: How Science Made Piltdown Man Human," *Science as Culture* 16 (2007): 333-57.

*Phillip V. Tobias and Others, "Piltdown: An Appraisal of the Case against Sir Arthur Keith," *Current Anthropology* 33 (1992): 243-93.

Frank Spencer, *Piltdown: A Scientific Forgery* (London: Oxford University Press, 1990).

Frank Spencer, *The Piltdown Papers, 1908-1955: The Correspondence and Other Documents Relating to the Piltdown Forgery* (London: Oxford University Press, 1990).

Keith Stewart Thomson, "Piltdown Man: The Great English Mystery Story," *American Scientist* 79 (1991): 194-201.

*J. S. Weiner, K. P. Oakley, and W. E. Le Gros Clark, "The Solution of the Piltdown Problem," *Bulletin of the British Museum (Natural History): Geology* 2 (1953): 141-233.

Mar. 15: The Controversy over Human Evolution [Inherit the Wind]

Required:

*Arthur Keith, *Concerning Man's Origin* (London: Watts, 1928), pp. v-viii, 1-20.

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, "'You Are Here': Missing Links, Chains of Being, and the Language of Cartoons," *Isis* 100 (2009): 571-89.

*Jeffrey P. Moran, "The Scopes Trial and Southern Fundamentalism in Black and White: Race, Region, and Religion," *Journal of Southern History* 70 (2004): 95-120.

Recommended:

*Peter J. Bowler, "Evolution and the Eucharist: Bishop E. W. Barnes on Science and Religion in the 1920s and 1930s," *British Journal for the History of Science* 31 (1998): 453-67.

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

Constance Areson Clark, *God—or Gorilla: Images of Evolution in the Jazz Age* (Baltimore: Johns Hopkins University Press, 2008).

Edward J. Larson, *Summer for the Gods: The Scopes Trial and America's Continuing Debate over Science and Religion* (New York: Basic Books, 1997).

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

Ronald Rainger, *An Agenda for Antiquity: Henry Fairfield Osborn and Vertebrate Paleontology at the American Museum of Natural History, 1890-1935* (Tuscaloosa: University of Alabama Press, 1991).

Brian Regal, *Henry Fairfield Osborn: Race, and the Search for the Origins of Man* (Burlington, VT: Ashgate, 2002).

Mar. 22: Human Evolution in South Africa

Required:

Lewin, *Bones of Contention*, pp. 47-84.

Raymond A. Dart, *Adventures with the Missing Link* (New York: Harper & Brothers, 1959), pp. 1-44.

Robert Broom, *Finding the Missing Link* (London: Watts, 1950), pp. 21-48.

*Wilfrid Le Gros Clark, "Bones of Contention," *Journal of the Royal Anthropological Institute of Great Britain and Ireland* 88 (1958): 131-45.

Lewin, "Australopithecine Biology" in "Principles of Human Evolution" pp273-282

*Phillip V. Tobias, "Ape-Like Australopithecus after Seventy Years: Was It a Hominid?" *Journal of the Royal Anthropological Institute* 4 (1998): 283 -308.

*Jesse Richmond, "Design and Dissent: Religion, Authority, and the Scientific Spirit of Robert Broom," *Isis* 100 (2009): 485-504.

Recommended:

George H. Findlay, *Dr. Robert Broom: Palaeontologist & Physician, 1866-1951* (Cape Town, A. A. Balkema, 1972).

Wilfrid E. Le Gros Clark, *Man-Apes or Ape-Men: The Story of Discoveries in Africa* (New York: Holt, Rinehart and Winston, 1967).

Lewin "Systematicss: Morphological and Molecular" in "Principles of Human Evolution" pp95-108.

| Lewin “Mechanisms of Macroevolution” in “Principles of Human Evolution” pp40-43.

Phillip V. Tobias, *Dart, Taung and the “Missing Link”* (Johannesburg: Witwatersrand University Press, 1984).

Frances Wheelhouse and Kathaleen S. Smithford, *Dart: Scientist and Man of Grit* (Sydney: Transpareon Press, 2001).

Mar. 29: SPRING BREAK

Apr. 5: Peking Man

Required:

Jia Lanpo and Huang Weiwen, *The Story of Peking Man* (Oxford: Oxford University Press, 1990), pp. 4-28, 61-71, 157-82.

Amir D. Aczel, *The Jesuit and the Skull: Teilhard de Chardin, Evolution, and the Search for Peking Man* (New York: Riverhead Books, 2007), pp. 71-103, 133-45.

Sigrid Schmalzer, *The People’s Peking Man: Popular Science and Human Identity in Twentieth-Century China* (Chicago: University of Chicago Press, 2008), pp. 33-54.

*Noel T. Boaz and Russell L. Ciochon, “The Scavenging of ‘Peking Man,’” *Natural History* 110 (March 2001): 46-51.

Recommended:

J. Gunnar Andersson, *Children of The Yellow Earth: Studies in Prehistoric China* (London: Kegan Paul, 1934).

George B. Barbour, *In the Field with Teilhard de Chardin* (New York: Herder and Herder, 1965).

Harry L. Shapiro, *Peking Man: The Discovery, Disappearance, and Mystery of a Priceless Scientific Treasure* (New York: Simon and Schuster, 1974).

Claire Taschdjian, *The Peking Man Is Missing* (New York: Harper & Row, 1977). A novel by the secretary to the director of the Cenozoic Research Laboratory in Peking and one of the last persons to see the Peking Man fossils.

Pierre Teilhard de Chardin, *Early Man in China* (New York: AMS Press, 1977).

Apr. 12: The Leakeys in East Africa

Required:

Lewin, *Bones of Contention*, pp.128-74, 189-252.

Recommended:

L. S. B. Leakey, *White African* (London: Hodder & Stoughton, 1937).

L. S. B. Leakey, *By the Evidence: Memoirs, 1932-1951* (New York: Harcourt Brace Jovanovitch, 1974).

Mary Leakey, *Disclosing the Past: An Autobiography* (Garden City, N.Y.: Doubleday, 1984).

Richard E. Leakey and Roger Lewin, *Origins* (New York: E. P. Dutton, 1977).

Richard E. Leakey and Roger Lewis, *Origins Reconsidered: In Search of What Makes Us Human* (New York: Doubleday, 1992).

Virginia Morell, *Ancestral Passions: The Leakey Family and the Quest for Humankind's Beginnings* (New York: Simon & Schuster, 1995).

Apr. 15: Lucy and Beyond

Required:

Lewin, *Bones of Contention*, pp. 268-300.

Donald Johanson and Maitland Edey, *Lucy: The Beginnings of Humankind* (New York: Simon and Schuster, 1981), pp. 13-24, 279-306.

*Ian Tattersall, "Out of Africa: Again . . . and Again?" *Scientific American* (April 1997): www.sciam.com.

Recommended:

Donald C. Johanson and Kate Wong, *Lucy's Legacy: The Quest for Human Origins* (New York: Harmony Books, 2009).

Jon Kalb, *Adventures in the Bone Trade: The Face to Discover Human Ancestors in Ethiopia's Afar Depression* (New York: Copernicus Books, 2001).

April. 26: DNA and Human Evolution (John Hawkes)

Required:

Lewin, *Bones of Contention*, pp. 85-127.

Recommended:

Bryan Sykes, *The Seven Daughters of Eve: The Science that Reveals Our Genetic Ancestry* (New York: W. W. Norton, 2001).

May 3: Continuing Debates (Floresiensis, Narratives, Ardipithecus)

Required:

Craig B. Stanford, *The Hunting Apes: Meat Eating and the Origins of Human Behavior* (Princeton, N.J.: Princeton University Press, 1999), pp. 16-51.

Lewin, *Bones of Contention*, pp. 30-46, 301-19.

Tim D. White and Others, "Ardipithecus ramidus and the Paleobiology of Early Hominids," *Science* 326 (2009): 64, 75-86.

*Kenneth W. Krause, "Pathology or Paradigm Shift? Human Evolution, Ad Hominem Science, and the Anomalous Hobbits of Flores" *Skeptical Inquirer* 33 (July/August 2009): 31-39.

*Tim D. White, "Ladders, Bushes, Punctuations, and Clades: Hominid Paleobiology in the Late Twentieth Century," in *The Paleobiological Revolution: Essays on the Growth of Modern Paleontology*, ed. David Sepkoski and Micheal Ruse (Chicago: University of Chicago Press, 2009), pp. 123-148.

*G. H. R. von Koenigswald, "Early Man: Facts and Fantasy," *Journal of the Royal Anthropological Institute of Great Britain and Ireland* 94 (1964): 67-79.

Recommended:

Misia Landau, *Narratives of Human Evolution* (New Haven: Yale University Press, 1991).