

Professor Michael D. Gordin (mgordin@princeton.edu)
Fall 2017, Thursdays, 1:30-4:20pm (Scheide-Caldwell 209)
Office Hours: Mondays, 9:30-11:30am (Dickinson 305)

History 498: History of Pseudoscience

A great deal of effort has been expended over the last several centuries in demarcating “science” from “non-science,” with only limited philosophical or practical success. The history of the border between what counts as science and what does not tracks the complex tensions in different times and places among science, religion, politics, and culture. This course explores the boundaries science has staked for itself — or has had staked out for it — by focusing on the elusive category of “pseudoscience.” What have different people at different points in time considered the character of natural knowledge, and how to attain it? What is at stake in appearing scientific? Why exclude certain practices and beliefs from this designation? Each week this course moves further backward in time to highlight the diversity of phenomena at the margins of science — to help understand better what science was in the past and is at present.

Course Requirements:

Participation:	20%
Weekly reactions (5 papers, 500 words apiece):	10%
Midterm paper (8-10 pages ¹):	30%
Final paper (15-20 pages ²):	40%

Device Policy:

Technologies have advanced in the past few years faster than the ability of etiquette protocols and norms of polite behavior to keep up. Hence I regretfully have to include this section in the syllabus. Please read it carefully.

Some of you may wish to do the readings for this course electronically — whether because you are more used to this mode, or to save trees, or for any other reason — and the articles are available on Blackboard precisely to facilitate this choice. However, it enormously inhibits conversation in a seminar when a wall of laptop screens, somewhat like a War Room, surrounds the table. Therefore, I ask that if you bring your laptop to class, you leave it closed *unless you are looking something up right then*, and then you should close it immediately afterward. (Needless to say, “looking something up” must relate to the class; your Instagram feed doesn’t fall into this category.) It is perfectly fine to have tablet devices (iPads, Kindles) open on the table at all times. You are obviously welcome to print out hard copies of the readings and/or bring in physical copies of the book.

I can think of no reason why you might need a phone during class. Please turn off your phones. Put them in your bags, away from temptation. I will certainly do the same to mine. If you text, or even read your texts, you run severe risks that are best left unmentioned. Well, I’ll mention one: if I suspect you are looking at your phone because you are staring dreamily into your lap, I will warn you, perhaps publicly; if I see you doing it again, you will be marked absent

¹ Double-spaced, normal font size, normal margins. Use your common sense, people.

² Same rules.

for that class and any future class in which it happens. It is really much easier if you just turn off your phone and put it in your bag.

Required Books: (available at Labyrinth)

- Bauer, Henry H. *The Enigma of Loch Ness: Making Sense of a Mystery* (Urbana: University of Illinois Press, 1986). [ISBN: 9781620322314; \$17.95]
- Freud, Sigmund. *Five Lectures on Psycho-Analysis*, tr. James Strachey (New York: Norton, 1961 [1909-1910]). [ISBN: 0393008479; \$13.95]
- Pennock, Robert T. and Michael Ruse, eds. *But Is It Science?: The Philosophical Question in the Creation/Evolution Controversy*, updated edition (Amherst, NY: Prometheus Books, 2009). [ISBN: 9781591025825; \$21.99]
- Principe, Lawrence M. *The Secrets of Alchemy* (Chicago: University of Chicago Press, 2013). [ISBN: 9780226682952; \$25]
- Reich, Eugenie Samuel. *Plastic Fantastic: How the Biggest Fraud in Physics Shook the Scientific World* (New York: Palgrave Macmillan, 2009). [ISBN: 9780230623842; \$17]

[Readings marked with an asterisk (*) are to available on Blackboard e-reserves.]

Assignments:

Participation: Each week's meeting focuses in depth on a particular doctrine that has been labeled as "pseudoscience" at a particular place and time, and students are expected to come prepared to each class having read carefully and reflected upon both the primary and the secondary readings.³ Active and thoughtful engagement with the material in the readings and the contributions of other students to class discussion is an essential component of the course.

Weekly reactions: By the end of the semester each student must have completed five (5) different reaction papers. These reactions are to be emailed to me (mgordin@princeton.edu) by 6pm on the evening before the seminar meets. (That is, if you are keeping track, *Wednesday evening*.) These papers should be five-hundred (500) words long and consist of critical reflections on one or several of the week's readings. (Of course, you should quote, with proper citations, from the readings when relevant; however, a 450-word quotation and a 50-word reaction to it will not pass muster.) I will send you back detailed comments on each reaction, and your thoughts will help shape the class discussion. Reaction papers can be handed in before any class between meeting 2 and 11, inclusive. (Week 1 is excluded because there is no time for the paper; week 12 is excluded for reasons we'll get into later in the semester.) It is entirely up to you which weeks you select, although I recommend you factor in both your interests and your schedule. Of course, whether or not you chose to turn in a reaction paper for a particular week, all the obligations for reading and reflection detailed above still apply.

Midterm paper: **Due in class meeting 6 — Midterm Week**. Select one of the following books (or another one approved by me) and read it carefully:

- a. Immanuel Velikovsky, *Worlds in Collision* (1950)

³ Primary sources are those composed in the historical time period in question; for example, the Gettysburg Address is a primary source. Secondary sources are written by historians or other commentators reflecting back on a historical episode, as in an analysis of Lincoln's oratory published in 2014 (or 1954, or 1892). Obviously, this is a matter of perspective. If I were interested in how the Gettysburg Address was viewed in different historical periods, then "secondary sources" might very well become my primary sources. The distinction between the two is particularly hard to sustain analytically for the history of very recent events, which is part of the reason for the temporal restrictions of the final paper.

- b. Erich von Däniken, *Chariots of the Gods?* (1968)
- c. L. Ron Hubbard, *Dianetics* (1950)
- d. Trofim D. Lysenko, *The Science of Biology Today* (1948)
- e. J. Allen Hynek, *The UFO Experience* (1972)
- f. Don Hunter and Rene Dahinden, *Sasquatch* (1975)
- g. Henry Bauer, *The Origin, Persistence and Failings of HIV/AIDS Theory* (1998)
- h. Eric Drexler, *Engines of Creation* (1987)
- i. James Lovelock, *Gaia* (1979)
- j. Jed Rothwell, *Cold Fusion and the Future* (2004) [[link](#)]

In an 8-10 page paper (normal font, normal margins), write a detailed analysis of the work, making frequent reference to specific passages of the text, addressing in the course of your argument the following questions: How does the author present his⁴ argument as scientific? Which “establishment/mainstream” sciences and scientific theories does he draw on? With which does he admit conflict? Which criticisms or allegations of pseudoscience does the author anticipate, and how does he deal with them? [This paper has to have an *argument* of its own and be a well-composed whole, not simply a laundry-list of answers to these questions. Find an angle that encompasses the whole work, and then develop answers to these questions within your frame.] The goal is not to establish or even to argue whether the theory is right or wrong, but rather to understand how *the author* makes his arguments appear credible. You do not necessarily have to do any additional research on the text in question, and it is perfectly possible to write an A-paper focused just on this one source; however, if you wanted to do some additional reading around the topic, you are certainly free to. Remember to use proper citations! You are not required to meet with the instructor to complete this assignment, but you might find it useful, and I’m always happy to see you. Students may turn in one rough draft by 11:59 on the Saturday before Midterms Week.

*Final paper: **Due Dean’s Date**.* Write a 15-20 page research paper (again with the normal fonts and margins) on any topic related to pseudoscience, fringe science, quack medicine, scientific controversies, or other marginal phenomena in the history of science. Given the difficulties of definition that we are going to be exploring all term, defining what “counts” in these categories is tricky (it’s actually part of the assignment), and you *must* have your topic approved by the instructor by the time class convenes for week 8. (It takes time to research a good paper; it also takes time to write one.) *Important!!!* — Your paper *MUST* satisfy at least one of two criteria: a) it must concern a topic that takes place *before 1945*⁵; or b) it must make significant use of unpublished archival collections.⁶ To get you thinking, here is a list of names and terms to help: Phrenology; Ignatius Donnelly; chiropractic; homeopathy; World-Ice Theory; Flat Earth doctrines; Spiritualism; astrology; Theosophy; Anthroposophy; palmistry; Hermeticism; physiognomy; racial science; chiropractic; dowsing; Charles Fort; wild children; electric medicine; clairvoyance; patent medicines; perpetual motion machines... Students may turn in one rough draft, due by noon on Thursday before Dean’s Date.

⁴ These books are all written by men. It is easily documentable that most fringe theories/doctrines are propounded by individuals with Y chromosomes. Why this happens to be the case is an open subject for discussion, and I trust it will come up in the course more than once.

⁵ If you select a topic that has a long afterlife (say, parapsychology), you must focus on the period before 1945.

⁶ Princeton University Library’s Special Collections has an impressive array of relevant materials, as do depositories in New York City and Philadelphia. I’d be delighted to discuss options with you, should you choose to write a paper in category (b).

How to Write a History Paper

- 1. EVERY ESSAY IS AN ARGUMENT.** This is the cardinal rule of writing history papers, or any other academic paper, for that matter. This means you must both make a claim and provide a logical structure in which to argue it. Think of the paper like a one-sided discussion you are having with your instructor. Try to convince me of what you believe.
- 2.** You must defend your argument; this is done with evidence. I know it sounds obvious. There is a clear hierarchy of what counts as reasonable evidence. In particular, material available online, *especially with respect to the kinds of topics we cover in this course*, must be treated gingerly. If you use a website as a primary (or secondary) source, be sure to explain why you find it credible. (You should actually get into the habit of doing this for all sources.) One important caveat: I consider Wikipedia to be highly unreliable on these topics. Don't rely on it in framing your essay, don't quote from it as an authority, and *certainly* do not plagiarize from it. Remember that a quotation is not evidence until you argue why it should be considered as such. Texts say many different things; when you select a quotation from one to support your argument, make sure that you articulate why it supports your point.
- 3.** You need to consider alternative points of view. Part of making an argument is to entertain other reasonable positions and explain why you don't find them as compelling as your own. Remember, you are trying to convince me you are right — which means you must be able to refute objections. This is hard to do within space constraints, but it is a vital part of what it means to make an argument — and will help you in making your points concisely and clearly.
- 4.** Anytime you quote anything, you must provide a reference. The most common way to do this is with a footnote, and there are many different formats, such as those in the MLA Handbook or the Chicago Manual of Style. Pick one, and use it consistently. In addition to footnotes, include a bibliography at the end of the paper. If you have questions about how to do this, where to learn various formats, or so on, talk to me or the Writing Center. You will be *MARKED DOWN* for poor and/or inadequate referencing. (Don't get me started on plagiarism. Inappropriate or cavalier “borrowing” from the work of others will be treated as harshly as Princeton permits — and that's pretty harsh. Let's avoid the unpleasantness of this, shall we?)
- 5.** Proofread. It is amazing how many errors can creep into a short paper. After you are done making all your points, read it through at least once *ON PAPER* so that you can correct typos, grammatical errors, and so on. (For bizarre and unexplained reasons this is infinitely harder to do on the computer screen.) This sort of thing counts — and will always count.
- 6.** Put page numbers on it. It drives me crazy when they are absent.
- 7.** Don't forget to sign it! Remember to reproduce and sign the language concerning academic fraud and integrity of work at the beginning or end of your paper. I cannot accept any papers that do not explicitly adhere to University codes of conduct. As noted above, suspected violations of University regulations will be taken very seriously.

Schedule of Meetings:

Meeting 1, 14 September: Introduction

Readings (to be distributed and read in class)⁷:

- * Hippocrates, "The Sacred Disease," in John Chadwick and W. N. Mann, eds. and trs., *The Medical Works of Hippocrates* (Oxford: Blackwell Scientific Publications, 1950): 179-193. [15]

Meeting 2, 21 September: Replication Crisis

Primary:

- * John P. A. Ioannidis, "Why Most Published Research Findings Are False," *PLOS Medicine* (30 August 2005), <http://dx.doi.org/10.1371/journal.pmed.0020124>.
- * Silas Boye Nissen, Tali Magidson, Kevin Gross, and Carl T. Bergstrom, "Publication Bias and the Canonization of False Facts," *eLife* 5 (2016), <http://dx.doi.org/10.7554/eLife.21451>.
- * Charles Gross, "Disgrace: On Marc Hauser," *The Nation* (9/16 January 2012): 25-32. [8]

Secondary:

- * Melinda C. Baldwin, "Credibility, Peer Review, and *Nature*, 1945-1990," *Notes and Records of the Royal Society* 69, no. 3 (2015): 257-279. [23]
- Reich, *Plastic Fantastic*, 11-128, 183-234. [170]

Meeting 3, 28 September: Intelligent Design

Readings:

Primary:

Charles Hodge, Duane Gish, Phillip E. Johnson, Michael Behe, and Judge John E. Jones II in Pennock and Ruse, *But Is It Science?*, 82-104, 231-252, 414-425, 434-455, 506-535. [109]

Secondary:

Ronald Numbers and Nick Matzke in Pennock and Ruse, *But Is It Science?*, 192-230, 377-413. [76]

Meeting 4, 5 October: Acupuncture

Readings:

Primary:

* J. J. Bonica, "Acupuncture Anesthesia in the People's Republic of China: Implications for American Medicine," *Journal of the American Medical Association* 229, no. 10 (1974): 1317-1325. [9]

* Herbert Benson, Martha M. Greenwood, and Helen Klemchuk, "The Relaxation Response: Psychophysiological Aspects and Clinical Applications," *International Journal of Psychiatry in Medicine* 6, no. 1-2 (March 1975): 87-98. [12]

"Bill Moyers Documentary on Qi," (6:09) watchable at <http://www.youtube.com/watch?v=IZRHy7EBrFY>

Secondary:

* Volker Scheid, "Hegemonic Pluralism: Chinese Medicine in a Socialist State," in Scheid, *Chinese Medicine in Contemporary China: Plurality and Synthesis* (Durham: Duke University Press, 2002), 65-106. [42]

⁷ Seriously, you don't need to read this in advance. We'll take the time in the middle of the first session to read it.

- * Nathan Sivin, "Traditional Chinese Medicine and the United States: Past, Present, and Future," *Bulletin of the American Academy of Arts and Sciences* 39, no. 8 (May 1986): 15-26. [12]
- * Anne Harrington, "Eastward Journeys," in *The Cure Within: A History of Mind-Body Medicine* (New York: Norton, 2008), 205-242, 288-295 (notes). [38]
- * Terri A. Winnick, "From Quackery to 'Complementary' Medicine: The American Medical Profession Confronts Alternative Therapies," *Social Problems* 52, no. 1 (February 2005): 38-61. [24]

Meeting 5, 12 October: Cryptozoology

Readings:

Primary:

Bauer, *The Enigma of Loch Ness*, 27-158. [132]

Secondary:

- * Sigrid Schmalzer, "'From Legend to Science,' and Back Again?: Bigfoot, Science, and the People in Post-Mao China," in Schmalzer, *The People's Peking Man: Popular Science and Human Identity in Twentieth-Century China* (Chicago: University of Chicago Press, 2008), 210-245. [36]
- * Joshua Blu Buhs, "Camping with Bigfoot: Sasquatch and the Varieties of Middle-Class Resistance to Consumer Culture in Late Twentieth-Century North America," *Journal of Popular Culture* 46, no. 1 (February 2013): 38-58. [21]

Meeting 6, 19 October: Aryan Physics

Readings:

Primary:

- * Klaus Hentschel and Ann M. Hentschel, eds., *Physics and National Socialism: An Anthology of Primary Sources* (Basel: Birkhäuser Verlag, 1996), 7-10, 100-116, 119-127, 152-161, 172-178. [38]
- * Samuel A. Goudsmit, "Freedom of Science," *Proceedings of the American Philosophical Society* 94, no. 2 (21 April 1950): 111-113. [3]

Secondary:

- * Mark Walker, "The Rise and Fall of an Aryan Physicist" and "The Alienation of an Old Fighter," in Walker, *Nazi Science: Myth, Truth, and the German Atomic Bomb* (Cambridge, MA: Perseus Publishing, 1995), 5-63. [59]
- * Mark Walker, "National Socialism and German Physics," *Journal of Contemporary History* 24, no. 1 (January 1989): 63-89. [27]
- * David C. Cassidy, "Heisenberg, German Science, and the Third Reich," *Social Research* 59, no. 3 (Fall 1992): 643-661. [19]

Meeting 7, 26 October: Parapsychology

Readings:

Primary:

- * J. B. Rhine, *Extra-Sensory Perception* (Boston: Boston Society for Psychical Research, 1934), 5-31, 109-125, 146-153. [52]
- * Edward V. Huntington, "Is It Chance or ESP?," *American Scholar* 7 (1938): 201-210. [10]
- * Irving Langmuir, "Pathological Science," ed. Robert N. Hall, *Physics Today* (October 1989): 36-48. [13]

* George R. Price, "Science and the Supernatural," *Science* 122, no. 3165 (26 August 1955): 359-367. [9]

Secondary:

* Michael McVaugh and Seymour H. Mauskopf, "J. B. Rhine's Extra-Sensory Perception and Its Background in Psychological Research," *Isis* 68, no. 2 (June 1976): 160-189. [30]

* H. M. Collins and Trevor J. Pinch, "The Construction of the Paranormal: Nothing Unscientific Is Happening," in R. Wallis, ed., *On the Margins of Science: The Social Construction of Rejected Knowledge, Sociological Review Monograph*, no. 27 (Keele: University of Keele Press, 1979): 237-70. [34]

Meeting 8, 9 November: Freudianism

Readings:

Primary:

Freud, *Five Lectures on Psycho-Analysis*, 3-62. [60]

Secondary:

* Frank Sulloway, "Reassessing Freud's Case Histories: The Social Construction of Psychoanalysis," *Isis* 82 (1991): 245-275. [31]

* Philip Rieff, "Reflections on Psychological Man in America," and "The American Transference: From Calvin to Freud," in Rieff, *The Feeling Intellect: Selected Writings* (Chicago: University of Chicago Press, 1990): 3-9, 10-15. [13]

* Edward Dolnick, "The Gospel According to Freud" and "The Power of Conviction," in Dolnick, *Madness on the Couch: Blaming the Victim in the Heyday of Psychoanalysis* (New York: Simon & Schuster, 1998): 19-51. [33]

* Richard Skues, "Clark Revisited: Reappraising Freud in America," in John Burnham, ed., *After Freud Left: A Century of Psychoanalysis in America* (Chicago: University of Chicago Press, 2012): 49-84. [36]

Meeting 9, 16 November: Eugenics

Readings:

Primary:

* Francis Galton, "Hereditary Talent and Character," *Macmillan's Magazine* 12 (1865): 157-166, 318-327. [20]

* Francis Galton, "Eugenics: Its Definition, Scope, and Aims," *American Journal of Sociology* 10, no. 1 (July 1904): 1-25. [26]

* C. B. Davenport, "The Eugenics Programme and Progress in Its Achievement," in *Eugenics: Twelve University Lectures* (New York: Dodd, Mead and Company, 1914): 1-14. [15]

Secondary:

* Kenneth M. Ludmerer, "American Geneticists and the Eugenics Movement: 1905-1935," *Journal of the History of Biology* 2, no. 2 (Autumn 1969), 337-362. [26]

* Nils Roll-Hansen, "Eugenics before World War II: The Case of Norway," *History and Philosophy of the Life Sciences* 2, no. 2 (1980): 269-298. [30]

* Nathaniel C. Comfort, "Fisher's Quest," in Comfort, *The Science of Human Perfection: How Genes Became the Heart of American Medicine* (New Haven: Yale University Press, 2012), 29-66. [38]

Meeting 10, 30 November: Mesmerism

Readings:

Primary:

- * *Report of Dr. Benjamin Franklin, and Other Commissioners, Charged by the King of France, with the Examination of the Animal Magnetism, as Now Practised at Paris, Translated from the French, with an Historical Introduction* (London: J. Johnson, 1785), entire. [126]

Secondary:

- * Robert Darnton, “Mesmerism and Popular Science,” in Darnton, *Mesmerism and the End of the Enlightenment in France* (Cambridge, MA: Harvard University Press, 1968), 3-45 [43].
- * Jessica Riskin, “The Mesmerism Investigation and the Crisis of Sensibilist Science,” in Riskin, *Science in the Age of Sensibility: The Sentimental Empiricists of the French Enlightenment* (Chicago: University of Chicago Press, 2002), 189-225. [37]

Meeting 11, 7 December: Alchemy

Readings:

Primary:

- * George Ripley, “Of Calcination: The First Gate,” in Stanton J. Linden, ed., *George Ripley’s Compound of Alchymy (1591)* (Aldershot: Ashgate, 2001), 28-32. [5]
- * Janus Lacinius Therapus, the Calabrian, “A Form and Method of Perfecting Base Metals,” in *The New Pearl of Great Price: A Treatise Concerning the Treasure and Most Precious Stone of the Philosophers* (London: James Elliott, 1894), 21-45. [25]
- * Robert Boyle, “The Third Part [extracts],” in Boyle, *The Sceptical Chymist* (London: J. M. Dent & Sons, 1944), 94-105. [12]

Secondary:

Principe, *The Secrets of Alchemy*, 1-7, 83-210. [125]

Meeting 12, 14 December: Demarcation

Readings:

- * Karl Popper, “Science: Conjectures and Refutations,” in Popper, *Conjectures and Refutations: The Growth of Scientific Knowledge* (New York: Routledge, 2002 [1963]), 43-78. [35]
- Larry Laudan, “The Demise of the Demarcation Problem,” in Pennock and Ruse, *But Is It Science?*, 312-330. [19]
- * Paul Feyerabend, “Introduction to the Chinese Edition” and “Chapter 1,” in Feyerabend, *Against Method*, 4th ed. (London: Verso, 2012), xix-xxii, 7-12. [10]
- * 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. [15]