HIST 427/527: SCIENCE IN NINETEENTH-CENTURY EUROPE
University of Oregon – Spring 2018 – CRN 36512

Instructor: Ian F. McNeely, Professor of History
Meeting times: TR 10:00-11:20 in 189 PLC
Office hours: TR 12:00-1:00 and by appointment in 319 MCK
Email: imcneely@uoregon.edu
Course webpage: https://canvas.uoregon.edu/courses/110213
My webpage: pages.uoregon.edu/imcneely

Description

Scientists in nineteenth-century Europe revolutionized our view of the world in several interlocking ways. They showed that the Earth is far, far older than the few thousand years envisioned by the Biblical creation story. They showed that its vast history is long enough for new species to have evolved from previous ones—as, indeed, humans have evolved from other primates. They showed that all life forms are in fact governed by intelligible natural processes, whether physical, chemical, or biological, from the tiniest microbes to the human mind itself. They showed that the laws of nature, operating invisibly through particles and forces, energy and fields, give rise to fantastic phenomena that we can harness and control. They showed that society itself exhibits lawlike properties: personal decisions to spend money or have children, commit crimes or even commit suicide, do in aggregate follow predictable statistical and psychological patterns.

In this course we examine how these discoveries transformed European culture. We want to know what people believed before they occurred and why they changed their minds. We want to know who championed these changes and who resisted them. And we want to know how they were understood by people living at the time—in ways that often differ markedly from our understandings of science today. To answer these questions, it is not enough to treat just the great men and ideas, the new experiments and instruments, or the big conceptual and technical breakthroughs. This would assume that science is a well-defined, autonomous activity, which it wasn’t. The nineteenth century was instead a time when the institutions of science and the role of the “scientist” were still in formation. Divisions we take for granted today—between science and religion, natural science and social science, expert science and popular science, real science and pseudoscience—were all much more fluid than they are now. This is exactly what makes the period fascinating.

Requirements

- Prospectus for research paper, 3-4 pp., due Tue. 4/24 by 10:00am (10%)
- Midterm exam, Thu. 5/10 in class (30%)
- Sample source, due Tue. 6/5 and Thu. 6/7 in class (0%—but penalty for lateness)
- Final exam, Tue. 6/12 from 8:00am-10:00am in our classroom (30%)
- Research paper of ~2,500 words* (30%), due Thu. 6/14 by 3:00pm
Policies

Readings: The success of this class depends on active student participation, which means doing the readings before class. Quite often, I will circulate questions in advance to guide your reading. But if participation lags, I reserve the right to institute mandatory quizzes.

Canvas: The prospectus and final paper must be posted to Canvas in DOC or DOCX format by the due date and time indicated.

Midterm and final exams: These will be open-book exams, largely non-cumulative and conventional in format, with identification, short-answer, and essay questions.

Research paper: Due at the end of exam week, this ~2,500 word paper should focus on one of the major course themes, frame a question using secondary sources, and answer it through analysis of primary sources.

Clinics: Some class meetings will feature a mini research “clinic” where students can pose research problems and get feedback from the class. Clinics will also provide occasions to discuss the conceptualization, research, writing, and formatting of the research paper. Guidelines on these matters cannot be distilled into a policy handout, so it is imperative that you attend class regularly.

Prospectus: By the beginning of the fourth week of term, you should have (1) identified a topic for your research paper, (2) located relevant sources, both primary and secondary, and (3) read enough of them to formulate a tentative argument for your paper. Your prospectus should cover all these things, plus (4) identify further questions and challenges that will drive the rest of your research.

Sample source: During the last week of class, you should bring five (5) copies of a one-page primary-source excerpt to be discussed in your research paper and be prepared to discuss it in groups and/or before the entire class.

Formatting: Please use Times New Roman 12pt or the equivalent, margins of 1-1¼”, and double spacing. Follow Chicago style or a rough equivalent for footnotes and include a separate bibliography at the end. Reckon on 225-250 words per page.

Grading standards: A- and B-level work demonstrates mastery of key facts and ideas and an ability to organize evidence clearly around topic sentences and a thesis statement or argument. A-level work must, in addition, demonstrate facility with abstract historical concepts and use them creatively to evaluate evidence and generate new insights. C-level work exhibits mere competence, whereas D-level work does not even rise to that standard. Fs are given for missing or incomplete work.

*Graduate students: Students in HIST 527 must prepare a longer (3,500+ word) research paper titled more toward the secondary literature in the history of science and/or European cultural history. Please consult me early in the course for further guidance.
## Schedule

* = PDF on Canvas under Files > READINGS. Other readings are at the UO Duck Store.

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Readings</th>
</tr>
</thead>
<tbody>
<tr>
<td>4/3</td>
<td>Introduction</td>
<td>(handout in class)</td>
</tr>
<tr>
<td>4/5</td>
<td>The earth unfathomably old</td>
<td>*Rudwick</td>
</tr>
<tr>
<td>4/10</td>
<td>The geological discovery of deep time</td>
<td>Larson, 5-75; Darwin, 53-63</td>
</tr>
<tr>
<td>4/12</td>
<td>Evolution before Darwin</td>
<td></td>
</tr>
<tr>
<td>4/17</td>
<td>Man descended from apes</td>
<td></td>
</tr>
<tr>
<td>4/19</td>
<td>Natural history as gentlemanly science</td>
<td>Larson, 79-101; Darwin, 65-81, 89-100</td>
</tr>
<tr>
<td>4/19</td>
<td>The impact of Darwinism</td>
<td>Darwin, 114-72, 293-7, 435-60</td>
</tr>
<tr>
<td>4/24</td>
<td>Eugenics and race theory</td>
<td>Larson, 153-7, 177-91; *Galton</td>
</tr>
<tr>
<td></td>
<td></td>
<td>➔ Prospectuses due</td>
</tr>
<tr>
<td>4/26</td>
<td>Brain and body like any other matter</td>
<td>*Taylor &amp; Shuttleworth;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>*McLaren</td>
</tr>
<tr>
<td>5/1</td>
<td>Physiology, energy, and the human motor</td>
<td>*Rabinbach, 1-7, 45-162</td>
</tr>
<tr>
<td>5/3</td>
<td>The study of life as laboratory science</td>
<td>*Virchow</td>
</tr>
<tr>
<td>5/8</td>
<td>The germ theory of disease</td>
<td>*Otis 2002; *Otis 1999</td>
</tr>
<tr>
<td>5/10</td>
<td>Midterm</td>
<td></td>
</tr>
<tr>
<td>5/15</td>
<td>Invisible forces subject to human control</td>
<td>*Dear</td>
</tr>
<tr>
<td>5/17</td>
<td>Physics: modeling the imponderable</td>
<td>*Hunt; *Winter</td>
</tr>
<tr>
<td>5/22</td>
<td>Mesmerism and cable telegraphy</td>
<td>Bulwer-Lytton</td>
</tr>
<tr>
<td>5/24</td>
<td>Science fiction</td>
<td></td>
</tr>
<tr>
<td>5/29</td>
<td>Society subject to lawlike patterns</td>
<td>*Hacking</td>
</tr>
<tr>
<td>5/31</td>
<td>Optional in-class research &amp; writing clinic</td>
<td>Le Bon</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Universities the best places for research

6/5  Student research presentations (none)
6/7  Student research presentations (none)
6/12 Final exam (8:00am-10:00am)

Readings

Books


Articles and book chapters
(posted on Canvas at Files > READINGS)


**Sample research topics**

This is by no means an exhaustive list; it is instead meant to showcase good examples of research topics. You are welcome to pick one of them or develop your own in consultation with me. As your research progresses, you will no doubt want to tighten your focus. I’ve provided hyperlinks in cases where there is one obvious book to start with.

Phrenology and crime
- Non-phrenological experiments on the localization of brain functions
- Alfred Russell Wallace’s spiritualism (or Oliver Lodge’s) (or Dmitrii Mendeleev’s)
- Faraday’s popular demonstrations of electricity and electromagnetism
- Helmholtz’s popularization of science (e.g. music, vision, the planets)
- Evolution and the scientific study of language: F. Max Müller vs. Darwin
- Herbert Spencer (evolutionist, philosopher, sociologist, polymath - pick a specific topic)
- The persistence of vitalism in microbiology and organic chemistry
- Reader response to Darwin (or to *Vestiges of the Natural History of Creation*)
- The nebular hypothesis and its relation to theories of evolution
- The recent scholarly rehabilitation of German Romantic Naturphilosophie
- Degeneration, crime, and race as scholarly and popular obsession
- The Huxley-Wilberforce debate (science vs. religion) as myth and reality
- The discovery of dinosaurs (Gideon Mantell, Richard Owen) and their visual depiction
- The mathematization of economics (Stanley Jevons, Alfred Marshall, and others)
- Heredity, germ plasm, and the discovery of chromosomes
- “Paper tools” and the culture of organic chemistry
- The Haeckel-Virchow debate on the scientific validity of evolution
- Haeckel’s polygenism (theory of multiple origins of the human species)
- Mesmerism and anesthesia/hypnotism/phrenology/spiritualism
- Industrial chemistry (fertilizer, dyes, medicines) or electricity (telegraphy, electroplating)
- Cholera epidemics: medical, political, and social responses
- The ethics of Pasteur’s experiments
- Mendelian genetics, its initial neglect, and contemporary responses to its rediscovery
- Darwinism in the Victorian novel
- Colonial botany and the science of empire
- Lord Kelvin’s reduction of the age of the earth
- The science of sexual difference (Darwinism, phrenology, conservation of energy, anthropology)
Evolution and revolution: radical politics and Darwinism
Frankenstein and radical science
Nerves, nervous ailments, neurasthenia
Social medicine as a medical complement and left-liberal political rival to germ theory
The advent of social and racial hygiene in Germany
The development of the atomic theory
National differences in chemistry, the modeling of electromagnetic fields, the ether, etc.
Theories of the spontaneous generation of life from inorganic matter
Anthropological museums in Britain and Germany
Electricity, exhibition, and experiment (including medical electrotherapy)
Durkheim’s study of suicide and its precursors
The roots of energy physics in British engineering culture
Statistics and the rise of life insurance, biometrics, theories of crime, theoretical physics
Intelligent design: the Bridgewater Treatises (or William Paley’s natural theology)
Galton’s study of hereditary genius
See also the primary-source anthology Embodied Selves, listed in the starter bibliography on p. 7 below, covering phrenology, mesmerism, memory, consciousness, hysteria, insanity, nerves, idiocy, criminality, childhood, race, sex, and other topics

Tips for research

The starter bibliography below, together with your course texts, will help you get started with your research. Items are hyperlinked to Google Books so you can preview the items easily. Some tips:

- As you read, mine footnotes and bibliography for leads to further sources.
- It is often best to use secondary sources to “drill down” to primary sources.
- Favor secondary sources published by university presses or academic journals since the 1980s.
- Remember to use Summit and/or Interlibrary Loan to get books that UO may not own.

Once you have identified a topic, I recommend several online aids to help you flesh out your bibliography:

- Google Books. Previews of many monographs; some coverage of nineteenth-century sources
- Historical Abstracts. Index of modern journal articles, often with abstracts and/or fulltext
- JSTOR. Fulltext archive of select scholarly journals in history and other fields.
- Project MUSE. Another fulltext article, particularly good on history of science.
- Academic Search Premier. Good for book reviews and some academic articles
- ECCO (Eighteenth-Century Collections Online). Vast online archive of primary sources published in the 1700s. Mainly in English.
- 19th-Century Masterfile. Another vast online archive of primary sources, including journals, newspapers, books, documents, artwork, and images.
- A-Z list of online library databases, including those covering the nineteenth century.

Note that Knight Library has almost full runs of major nineteenth-century periodicals, including The Edinburgh Review (Whig), The Westminster Review (Radical), and The Quarterly Review (Tory).

Starter bibliography

(+ = especially good places to start)


