



# HPSC0081

## Science in the Nineteenth Century

### Syllabus

Session	2019-20
Moodle site	<a href="https://moodle.ucl.ac.uk/course/view.php?id=22872">moodle.ucl.ac.uk/course/view.php?id=22872</a>
Timetable	<a href="http://www.ucl.ac.uk/timetable">www.ucl.ac.uk/timetable</a> <i>or</i> <a href="https://www.tinyurl.com/hpscga24">www.tinyurl.com/hpscga24</a>

### Description

The nineteenth century saw the origin of much of what we might identify as “modern” scientific and technological research and practice. Laboratories, factories explorations, empires – all had scientific significance and all were paramount in nineteenth century science. This is also perhaps the period which has enjoyed most sustained attention from historians of science. This course will give a critical introduction to some major themes of nineteenth century science, from a range of historical approaches.

### Key Information

Assessment	15%	essay (up to 1,000 words)
Assessment	85%	essay (up to 4,000 words)
Required texts	readings listed in schedule	

## Module tutors

Convenor	Dr Cristiano Turbil
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Office location	22 Gordon Square,
Office hour	Tuesday 1-2pm; Thursday 1-2pm or by appointment
Tutor	Dr Tiago Mata
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Tutor	Professor Frank James
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## Aims and objectives

### Aims

This is a Masters-level module. HPSC0081 pursues several kinds of goals. First, this is a module about the history of science and technology. This includes not only the substance of science, but also the people, places, contexts and consequences that surround and help to shape the course of events. Time is strictly limited in this module, so we've made some choices about how to focus the curriculum.

Content aims are straightforward:

- identify key themes in 19thC science, both regarding content and historiography
- study this period in an integrated way, combining written sources, material artifacts, physical geography, and cultural geography
- while the focus is primarily on the British diaspora, this module will integrate some limited material from other contexts and geographies

The nineteenth century is a subject given considerable attention in English-speaking academic communities. The secondary literature is enormous. Another aim is to further develop the ability to assess interpretative work and relate evidence to interpretations.

Primary sources will make up some of the essential readings. The aim is to promote a direct encounter with the activity in this period. Students are expected to further develop their skills working with original source materials: critical reading of testimony and evidence, plus critical reflection on their interpretation and extension. They also will be expected to develop further research skills to integrate archives, museum collections, and digital resources.

### Objectives

#### *Knowledge*

By the end of this module students should be able to:

- demonstrate key themes in 19thC science, both in content and historiography

- demonstrate an ability to research historical topics, including collecting and assessing primary sources, and relating primary sources to historiographical themes,
- demonstrate an ability to test historiographical arguments and develop relational points
- demonstrate professional-level research skills that integrate archives, museum collections, and digital resources

### *Transferrable and Key Skills*

By the end of this module students should be able to:

- demonstrate the ability to critically interpret both primary and secondary sources
- demonstrate skill in historical reasoning and comparative analysis
- demonstrate skill collecting primary materials relevant to the 19thC
- relate geographic and architectural knowledge to other types of historical artifacts
- approach new material in this course's domain from a historical perspective and with a critical historian's eye
- demonstrate critical analysis of science communication and public engagement over a variety of venues

## **Module plan**

Student responsibilities in this module will revolve around two components: seminars and writing. Two writing projects will be required: an analysis of source material and a research proposal.

### **Seminars**

A series of seminars is timetabled, with two contact hours per week. Seminars are related to specific required readings, and students should come to seminar having read the essential material. They should be prepared to actively discuss that material and engage with others.

Additional readings and Web sites are suggested for continued investigation of module topics. We expect students to actively engage module themes.

### **Writing**

One 1,000-word analysis of source material will be required. Details are below.

One 4,000-word essay also will be required. Details are below.

## **Schedule**

This schedule lists topics for class sessions. Most reading materials are available via Moodle, as are instructions for what we'd like you to prepare prior to the session. Unless otherwise noted, students are expected to have read the primary and secondary materials prior to class.

Also on the schedule are due dates related to the assessment and dates for optional activities undertaken by the department.

Date	Topic	Primary Material	Secondary Material
3rd October	Introduction: 'The nineteenth century: science, medicine and technology'	Distributed in class	John V. Pickstone, 'Ways of Knowing: Towards a Historical Sociology of Science, Technology and Medicine', <i>The British Journal for the History of Science</i> , 4 (1993), 433-458.
10th October	Birth of the Clinic	Michel Foucault, <i>The Birth of the Clinic</i> , (London, 2003), 'Preface', ix-xix; 'Spaces and Classes', 3-21.	N. D. Jewson, 'The Disappearance of the Sick-Man from Medical Cosmology', <i>Sociology</i> , 10 (1974), 369-85
17th October	Victorian Sensation	Humphry Davy, <i>Consolations in Travel</i> , (London, 1830), 'The Vision', 1-59.	James A. Secord, <i>Victorian Sensation: The Extraordinary Publication, Reception, and Secret Authorship of Vestiges of the Natural History of Creation</i> , (Chicago, 2001), 'Prologue: Devils or Angels', 1-6; 'A Great Sensation', 9-40.
24th October	Science and Religion	Charles Bell, <i>The Hand; Its Mechanism and Vital Endowments, As Evincing Design</i> , (London, 1834); 'Introductory', 1-17; 'Chapter VII, Of Sensibility and Touch', 170-190	Carin Berkowitz, 'Charles Bell's Seeing Hand: Teaching Anatomy to the Senses in Britain, 1750-1840', <i>History of Science</i> , 52 (2014), 377-400
31th October	Darwin and Darwinism	Darwin, Charles Robert. 1872. <i>The origin of species by means of natural selection, or the preservation of favoured races in the struggle for life</i> . London: Murray. 6th ed Read introduction and <b>CHAPTER IV. NATURAL SELECTION; OR THE SURVIVAL OF THE FITTEST.</b> <a href="http://darwin-online.org.uk/content/frameset?itemID=F391&amp;viewtype">http://darwin-online.org.uk/content/frameset?itemID=F391&amp;viewtype</a>	Either Moore, James. 1982. "Charles Darwin Lies in Westminster Abbey." <i>Biological Journal of the Linnean Society</i> 17 (1):97-113.  Or Bowler, Peter J. 1988. <i>Non-Darwinian revolution: reinterpreting a historical myth</i> . Baltimore, MD: Johns Hopkins University Press, pp. 1-19.

		<a href="#">pe=text&amp;pageseq=1</a>	
6th November	Reading Week	No lectures scheduled	
14th November	Analogies between political economy and physics Dr Tiago Mata	William Stanley Jevons. Theory of Political Economy. 1888[1871]. Excerpt of chapter 4, pp. 75-105 only. Available at: <a href="https://oll.libertyfund.org/titles/jevons-the-theory-of-political-economy">https://oll.libertyfund.org/titles/jevons-the-theory-of-political-economy</a>	Norton Wise, M; Smith, Crosbie "Work and Waste: Politican Economy and Natural Philosophy in Nineteenth Century Britain (I)" History of Science. 1989; 27, 3: 263-301.  Norton Wise, M; Smith, Crosbie "Work and Waste: Politican Economy and Natural Philosophy in Nineteenth Century Britain (II)" History of Science. 1989; 27, 4: 391-449.  Philip Mirowski. More Heat than Light : Economics as Social Physics, Physics as Nature's Economics. Cambridge : Cambridge University Press: 1989, Chapter 5 "Neoclassical economic theory: An irresistible field of force meets an immovable object.", pages 193-275. [a more advanced text]
21th November	Amateurs, professionals and the Victorian marketplace.	Distributed in class  The Butler-Romanes controversy	Jonathan R. Topham, "Introduction," <i>Isis</i> 100, no. 2 (June 2009): 310-318.  And  Ralph O'Connor, "Reflections on Popular Science in Britain: Genres, Categories, and Historians," <i>Isis</i> 100, no. 2 (June 2009), 333-345  or  Aileen Fyfe and Bernard Lightman, 'Science in the

			Marketplace: An Introduction,' in Fyfe and Lightman (eds.), <i>Science in the Marketplace: Nineteenth-Century Sites and Experiences</i> (Chicago: University of Chicago Press, 2007), 1-19
28th November	Industrialisation and Mining- James Frank	Faraday, Michael and Charles Lyell. 1845. "The explosion at the Haswell Collieries and on the means of preventing similar incidents," <i>The London, Edinburgh and Dublin Philosophical magazine and journal of science</i> XXVI: 16-35.	Hunt, Bruce. 1991. "Michael Faraday, cable telegraphy and the rise of field theory." <i>History of Technology</i> 13:1-19. James, Frank A. J. L., and M. Rayb. 1999. "Science in the Pits: Michael Faraday, Charles Lyell and the Home Office Enquiry into the Explosion at Haswell Colliery, County Durham, in 1844." <i>History and Technology</i> 15:213-231.
5th December	Imperial Science	Andrew Davidson (ed.), <i>Hygiene and Disease of Warm Climates</i> , (London, 1893); 'Malarial Diseases', 113-217 (skim read).  Report of the Plague Commission for Hong Kong (1895), pp1-24.	Laura Otis, <i>Membranes: Metaphors of Invasion in Nineteenth-Century Literature, Science, and Politics</i> , (Baltimore, 2000); 'Introduction', 1-7; 'Virchow and Koch: The Cell and the Self in the Age of Miasmas and Microbes', 8-36.  And  Bashford, Alison. <i>Imperial Hygiene : A Critical History of Colonialism, Nationalism and Public Health</i> , Palgrave Macmillan, 2003. ProQuest Ebook Central, <a href="https://ebookcentral.proquest.com/lib/kcl/detail.action?doid=258214">https://ebookcentral.proquest.com/lib/kcl/detail.action?doid=258214</a> . read chapter 1 and 2

<p>12th Decemb er</p>	<p>The turn of the century: science, medicine and modernity</p>	<p>Galton, Francis, July, 1904. 'Eugenics: Its Definition, Scope, and Aims'. <i>The American Journal of Sociology</i>. X (1): 82 <a href="https://archive.org/details/jstor-2762125">https://archive.org/details/jstor-2762125</a></p> <p>Paolo Mantegazza, <i>Physiology of Love</i> (1894) chapter 19, <i>The Degradations of Love</i>, pp. 259-71. Available here <a href="http://www.jstor.org/stable/10.3138/9781442688797">http://www.jstor.org/stable/10.3138/9781442688797</a></p> <p>Maurice Parmerlee, 'Introduction', in Cesare Lombroso, <i>Crime, Its Causes and Remedies</i>, (Montclair, 1911), xi-xxxii</p>	<p>David Horn, <i>The Criminal Body: Lombroso and the Anatomy of Deviance</i>, (London, 2015); 'Bodies of Evidence', 1-28</p> <p>Sigusch, Volkmar. 2008. 'The Birth of Sexual Medicine: Paolo Mantegazza as Pioneer of Sexual Medicine in the 19th Century', <i>Journal of Sexual Medicine</i> 5: 217–222.</p>
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## Assessment

### Source Analysis

Due date: 5pm, Friday 1<sup>st</sup> November

1,000 words maximum

Please provide an in-depth source analysis of one or more sources pertaining to science in the nineteenth century.

You may choose to focus on one of the topics covered in the seminars, or you may choose to look beyond and follow your own interests.

You may want to consider the following questions:

1. What can you learn from the physical nature of the source?
2. What is the purpose of the source?
3. How does the author try to achieve that purpose?
4. What do you know about the author? Race, sex, class, occupation, religion, age, region, political beliefs? Does any of this matter?
5. Who was the intended audience?
6. What are the important metaphors or symbols?
7. What can the author's choice of words tell you?
8. What about the silence? What does the author choose not to talk about?
9. Is the source prescriptive or descriptive?
10. Does it describe ideology or behaviour?
11. What historical questions can you answer using this source?
12. What historical questions does this source prompt?
13. What question can this source not help you answer?
14. Does your analysis of this source fit with other historians' interpretations?
15. Does this source challenge or support the historiography?

Not all of these questions will be relevant to your chosen source[s], and you will not be able to answer them all effectively in 1000 words.

This is an exercise designed to help prepare you for more in-depth historical research. It might be beneficial, therefore, to think about this assessment in tandem with your Research Proposal.

The secondary material listed above will all reference primary source material that you might want to look at when making your selection.

There is an abundance of primary source material pertaining to science in the nineteenth century available online in digitised form (see list below).

However, you might also like to look at physical texts or objects. There are many places, local to UCL, that can provide access to such source material (see list below).

Finally, while scientific texts might provide the most obvious examples of relevant primary source material, feel free to take an expansive definition of 'Science' in the nineteenth century (and, to an extent, an expansive definition of the 'nineteenth century' – the 'long' nineteenth century is entirely acceptable). As well as scientific and medical tracts, treatises, and journal articles, you might like to look at letters, magazine, newspaper articles, advertisements, diaries, fiction, poetry, etc. You also need not confine yourself to textual sources. Drawings, paintings, photographs, albums, and objects can all form the basis of an effective source analysis.

I recommend you discuss your chosen source with Cristiano, Joe, or Frank (depending on its subject matter) well in advance of the deadline.

## Research Proposal

Due date: 5pm, Friday 10<sup>th</sup> January 2020

4,000 words maximum

Imagine you are applying to a PhD programme. Write a research proposal. As a description of your proposed topic, it should enable the selector (or marker) to evaluate the scope and importance of your project. The aim of the research proposal is to demonstrate that you have a project both worth doing and manageable within the timescale of the degree for which you are applying.

Your project must make an original contribution to understanding in its field. To make clear that your project is manageable within the relevant period, you also need to show that you understand the scale of the issues and problems you are addressing. This is a scholarly piece of writing. Except for the research questions, your proposal should be written in continuous prose, not bullet points or numbered lists. Please reference appropriately, including footnotes where necessary.

In order to do these things, your proposal should include:

- 1) Provisional Title
  - a. Be as concise and explicit as you can, including, where appropriate, dates.
- 2) Introduction
  - a. Use this section to introduce the question and issues central to your research
  - b. Identify the field of study in broad terms and indicate how you expect your research to intervene in the field.
- 3) Research Background and Questions
  - a. This section is for you to situate your project in the context of the existing scholarship on your topic of study. Your 'topic of study' is not only 'Science in the Nineteenth Century', although it is important to place yourself within broad trends and historiographical ideas, but could be 'Eugenics in the Nineteenth Century', or even, 'Cesare Lombroso'. It is important to recognise the multiple levels of historiographical context.
  - b. What are the key texts and approaches to the topic?
  - c. Please include several research questions. It is important that you set out your research questions as clearly as possible, explain problems that you want to explore, and say why it is important to do so.
  - d. How does your proposal differ from other lines of argument?

- e. How does your project extend our understanding of particular questions or topics?
- 4) Research Methods
  - a. This section should set out how you will achieve what you set out to do in 'Research Background and Questions'.
  - b. This will depend very much on your research topic.
  - c. What sources will you use? In other words, does your project involve archival sources, particular databases, or specialist libraries?
  - d. Is your study interdisciplinary?
  - e. What theoretical resources do you intend to use and why?
  - f. What forms of textual, historical or visual analysis are relevant to your topic or field?
  - g. How will you set about answering your research questions?
- 5) Schedule of Work
  - a. Use this section to show that you have a realistic plan for completion of the study within three to four years (full time).
  - b. You need to think here about dividing the proposal into sections (not necessarily chapters at this stage) and giving an indication of how you plan to research and write up each section.
- 6) Bibliography (not counted in the word limit)
  - a. Include a bibliography, in a standard and consistent format, listing the books and articles to which you refer in the proposal.

The selectors (marker) who read your proposal know that it is a provisional statement and that your ideas, questions and approaches will change during the course of your research. You should treat the proposal as an opportunity to show that you have begun to explore an important area of study and that you have a question, or questions, that challenge and develop the area. It is also necessary to demonstrate that you can express your ideas in clear, precise, and persuasive English, accessible to a non-specialist.

## Supporting Information

Please discuss your research proposal with us well in advance of the due date. Best to e-mail to make an appointment.

The criteria for assessment will be available via the Moodle site. Marks generally follow the departmental criteria for assessment. In sum, essays will be assessed on the following terms:

- the depth of scholarship and use of resources beyond those in lecture and required reading
- the ability to identify both major and subtle points of the subject
- the extent of your critical assessment
- the evidence you provide for having reflected on and extended module content and themes
- the general scholarly presentation of the work performed

The most common criticisms on student essays relate to:

- too much description/summary of readings and not enough analysis
- not developing your own argument
- no evidence of independent research
- terrible organisation and poor referencing techniques