

# HPSC0069

## Science in Nineteenth Century London

### Syllabus

Session	2018-19
Moodle site	<a href="https://moodle-1819.ucl.ac.uk/course/view.php?id=7472">https://moodle-1819.ucl.ac.uk/course/view.php?id=7472</a>
Timetable	<a href="http://www.ucl.ac.uk/timetable">www.ucl.ac.uk/timetable</a> <i>or</i> <a href="https://tinyurl.com/hpsc0069">tinyurl.com/hpsc0069</a>

### Description

The nineteenth century experienced a tremendous expansion of science. This module explores that expansion through the lens of popularization, public engagement, and presentation. We cover a variety of settings, including museums, lecture halls, publishing devices, parlors, and private collections. We also cover a variety of communities and types of activities, including professional societies, amateur clubs, working men's clubs, and ephemeral consumer activity. How did the many venues come together to create an integrated world in which science was experienced? How do historians relate science in public to science done elsewhere? Do STS analytical tools and concepts help us understand historical activity related to science in public? This module includes visits to some of the surviving attractions of nineteenth century science.

### Key Information

Assessment	1x1000 words – essay - primary source research 1x1000 words – essay - plan 1x3000 words – essay – research paper
Credits	15 credits   150 study hours
Prerequisites	none
Required texts	readings listed below

## Module tutors

Module tutor	Professor Joe Cain
Contact	J.Cain@ucl.ac.uk   t: 020 7679 3041
Web	<a href="http://www.ucl.ac.uk/sts/cain">www.ucl.ac.uk/sts/cain</a>
Office location	22 Gordon Square, Room 1.3
Office hours:	Mondays 12:00-13:00 and Wednesdays 10:00-11:00 what's an office hour? See: <a href="http://profjoecain.net/office-hour-explained/">profjoecain.net/office-hour-explained/</a>

## Aims and objectives

### aims

As an advanced module, HPSC0069 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 content and historiography
- survey patterns of popularization, public engagement, and presentation in the 19thC, and relate this survey to other periods
- consider how London functioned as a landscape for 19thC science
- study this period in an integrated way, combining written sources, material artifacts, physical geography, and cultural geography

Primary sources make up much of the required 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.

The nineteenth century is a subject given considerable attention in English-speaking academic communities. The secondary literature is enormous. This module will use secondary sources to elaborate particular themes as well as to drive interpretation in particular directions. One aim is to introduce some of the main themes in this body of literature. Another aim is to further develop the ability to assess interpretative work and relate evidence to interpretations, and vice versa.

The teaching method for this module during contact hours will be lectures and in-class discussions. A schedule of independent reading and research also is set. Module assessment is integrated into this programme of study.

### objectives

#### *Knowledge*

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

- demonstrate key themes in 19thC science, both content and historiography
- demonstrate an ability to research historical topics, including collecting and assessing primary sources, relating primary sources to historiographical themes, testing historiographical arguments, and developing relational points.

- demonstrate an understanding of geographical enablers and constraints as they apply to 19thC London
- 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 three components: lectures and a research project culminating in a research paper. There is no examination.

### class sessions

A schedule for class sessions is set. Lectures are related to specific themes and essential materials. Lectures critically survey key content and historiography relevant to each theme. This also includes discussions of set readings. Students are expected to come to lecture having read and reflected on discussion materials set for the session. Additional source materials are suggested for continued investigation of module topics. I expect students to actively engage module themes throughout the term.

### essay

The assignment for this module is 100% essay of up to 5,000 words maximum, divided into three elements:

- 1x1000 words – essay - primary source research
- 1x1000 words – essay – plan
- 1x3000 words – essay – research

Particulars are provided below.

## Schedule

This schedule lists topics for class sessions. Most materials are available via Moodle, as are instructions for what I'd like you to prepare prior to the session. The activities here consist:

**Discussion materials** indicate readings you need to read before class and be prepared to discuss

**London's history** are locations in London we'll use as an organizing tool; perhaps, you'll want to visit them at some point during your studies

**Essential readings** are sources of particular value to the session and which can serve to support the discussion and any related research you might undertake. I expect you to come to each session

prepared to engage the **discussion material**, but not necessarily the **essential** or **recommended** readings. I expect relevant essential readings to be used in essay elements. You would be wise to assess the recommended readings, too, as these are provided as relevant, useful additional materials.

## Week 20 Science in 19thC London

<b>07 January 2019</b>	Professor Joe Cain
Discussion material	UoL ([1826, 1828] 1991) (on Moodle site)
London's history	UCL Wilkins Building
Essential reading	Harte et al (2018: 34-59)
Recommended reading	Babbage (1830) demonstrates the meritocracy complaining about the aristocracy. UoL (1829) offers lectures from the first set of professors at the University of London.
Objective	Introduction to history of science in the 19thC and to the module. Discussion of coursework.

## Week 21 Great Exhibitions

<b>14 January 2019</b>	Professor Joe Cain
Discussion material	Hunt (1851), CPC (1871)
London's history	Crystal Palace Park
Essential reading	Qureshi (2011: 101-125) examines anthropological and ethnographic displays at exhibitions on this scale.
Recommended reading	Bellon (2007) presents a day-in-the-live approach to visiting Hyde Park in 1851. Haller (1971) presents a wider context for racial theories in this period. Waterhouse Hawkins (1854) is a public lecture about the dinosaur sculptures in Sydenham.
Objective	Compare 1851 Hyde Park "Great Exhibition" and 1854 Sydenham Crystal Palace and the culture of exhibition of science (and other things) in mid 19thC London.

## Week 22 Cathedrals to Science

<b>21 January 2019</b>	Professor Joe Cain Also, we will visit UCL Grant Museum of Zoology 11-12 to examine 19thC zoological museums.
Discussion material	Mantell (1851: 335-338) and skim Owen (1862)
London's history	Grant Museum of Zoology and Comparative Anatomy
Essential reading	Torrens (1995) is a detailed study of Mary Anning's biography.
Recommended reading	Sheets-Pyenson (1988) is the classic discussion of museums as cathedrals; Knapp (2005) focuses on NHM London; Acland (2008 [1859]) describes the architectural concepts associated with Oxford Museum of Natural History. Rudwick (2000) supplements physical buildings with virtual museums; Laudan (1987: 201-221) focuses on Charles' Lyell's uniformitarianism as an organizing theory for philosophical geology. Also see Grant's lecture in UoL (1829), noted above and given context by Dawson (2016), contrasts sharply with natural philosophers discussed in Gibson (2015). The quasi-religious sentiment of these institutions is supported by Tyndall's (1874) famous assertion that science is the new religion.
Objective	Follow the rise of natural history museums as part of the scientific and

	cultural landscape of London, while the metropolis grew. Compare natural history institutions with those for other sciences in London at the same time.
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### Week 23 Gentlemen of Science

<b>28 January 2019</b>	Professor Joe Cain
Discussion material	Higgitt and Withers (2008)
London's history	Burlington House
Essential reading	Barton (1990) is a classic study of the X-club. Babbage's (1830) complaint about the aristocratic Royal Society (noted above) contributes to a sense of discontent.
Recommended reading	Watts (2007: 99-133) asks about the place of women in this period of (male-driven) organization of scientist communities; Secord (1996) and Alberti (2001) examine the conceptualization of amateur as an opposite to professional. Waller (2001) uses Francis Galton as an example of a professionalizer, showing what his ambitions were. Galton (1872, 1906) demonstrate his application of "scientific methods" to simple cases. Bellon (2001) does the same for Joseph Dalton Hooker.
Objective	Professionalization in 19thC London involved new institutions and organizations. We explore their growth and the consequences of decisions made.

### Week 24 Aquaria and Zoos

<b>04 February 2019</b>	Professor Joe Cain
Discussion material	Davenport (1863: 64-84)
London's history	London Zoo
Essential reading	Thwaite (2002: 170-203) follows the work of Phillip Henry Gosse in the aquarium craze. Stott (2003: ) revises the history of invention for aquaria from male to female and from 1850s to 1830s. Shteir (1987) focuses attention on the education of girls and women in science through the development of "popular" science and "education" activities.
Recommended reading	Rothfels (2002) is a history of Zoological Society of London. Fraser (1868) is another example of a seaside primer. Allen ([1992] 2001) investigates the similar fern craze in British natural history, and Allen (1994) provides a general social history of natural history collecting.
Objective	Examine the aquarium craze in the 1850s and its relationship to gendered histories of science; consider fads and fashions in natural history.

### Week 25 Reading Week

<b>11 February 2019</b>	No session
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### Week 26 Bridges, Canals, Docks

<b>18 February 2019</b>	Professor Joe Cain
Discussion material	Roscoe ([1839]: 1-48)

London's history	Museum of London Docklands
Essential reading	Smith (1825) describes the Thames Tunnel project for investors; Marryat (1823) describes some of London's docks for investors.
Recommended reading	Hunt (1991) relates Faraday's researches to applications in telecommunications.
Objective	London become a metropolis in the 19thC and its transport infrastructure evolved considerably. Investigate the role of science and technology in London's transport networks.

## Week 27 Crossroads for Empire

<b>25 February 2019</b>	Professor Joe Cain
Discussion material	Carey (1814)
London's history	Royal Botanic Gardens Kew
Essential reading	Brockway (1979: 77-102) and Schiebinger (2004: 1-22) represent the history of botanical gardens as a history of agents in imperial extraction.
Recommended reading	Headrick (1988) represents communication infrastructure as a two-way agent in colonial operations. Secord's (2004) "knowledge in transit" model offers criteria for measuring success in the flow of knowledge through global networks. Hobhouse (1985) focuses on individual plants in defining colonial networks and impacts.
Objective	Relate botanical gardens to empire. Investigate integration of science in global economic activity.

## Week 28 Rise of Public Health

<b>04 March 2019</b>	Dr Cristiano Turbil
Discussion material	Chadwick (1843: 1-24)
London's history	Thames Embankment
Essential reading	Allen (2008: chapters 1 and 2)
Recommended reading	Allen (2008); Hamlin (1997); Dobraszcyk (2009); Jackson (2014)
Objective	To reflect critically meanings of health, surveillance and the state, and the relationship between them. To analyse why, in mid-19th century London, the public's health became a state responsibility. To explain the nature of state intervention and why it provoked controversy.

## Week 29 Psychology, Nerves, and the Brain

<b>11 March 2019</b>	Dr Cristiano Turbil
Discussion material	Sully (1910: 1-20)
London's history	Psychological research at UCL; First psychological laboratory in UK
Essential reading	Danzinger (1997: 51-64)
Recommended reading	Danzinger (1990); Janko (1995); Richards (1989); Schaffer (1994)
Objective	To explore the history of nineteenth century psychology; To discuss the rise of psychology as a university subject focusing in particular on UCL; To explore the new cultural meaning of the human brain in the Victorian context.

## Week 30 Audiences and Readers

<b>18 March 2019</b>	Professor Joe Cain
Discussion material	Huang (2015b) (astronomy) <i>or</i> Faraday ([1861]) (physical sciences)
London's history	Royal Institution of Great Britain
Essential reading	Fyfe (2007) and Lightman (2007) refocus history of science onto readers and audiences.
Recommended reading	Kohlstedt (1990) discusses parlor culture in US and compares with Shteir (1987); Moore (1985) presents Darwin's family as a consumer of science; Merrill (1989) is a detailed study of readership; Ashton (2008) and Keighren, et al (2015) are detailed studies of publishing houses. Secord (2014, 2000) offer integrated studies of authors and readers. Huang (Huang 2015a) studies popular science lectures in 19thC London. Moore (2017) is one of many studies of mesmerism and audiences in Victorian London.
Objective	Most people encounter science most of the time through reading and through public lectures. Relate London's publishing industry and entertainment industry to science in the metropolis.

## Assessment

### summary

Description	%	Deadline	Word limit
Primary source report	20%	Two calendar weeks after presentation in class	1000 words
Research plan	20%	TBC	1000 words
Research paper	60%	TBC	3000 words

### coursework: elements

Coursework is divided into three elements.

#### *a. primary source report (20%)*

Each session has primary source material selected. You'll be assigned to lead a discussion in one session about the material assigned for it. You are asked to submit a summary analysis of that material with the following elements:

- an abstract of the text
- an assessment of historical relevance
- open questions about the source
- an annotated list of supporting material, including no fewer than two directly related secondary sources and at least one other related primary source.

This report should be a synthesis of your own views and views contributed by the class you think are helpful for understanding the material. Your aim is to produce a document that offers preparation for your successor who presents the same material in the future.

Please use the template provided on the module Moodle site.

In fairness to all, the due date for each report will be *two calendar weeks* after the date scheduled for presentation. In the event a presentation is missed, the due date will remain as planned. Students are encouraged to draft their report in preparation for their session.

*b. research plan (20%)*

A plan should identify the title you'll use for your research paper and present a preliminary inventory of resources to be used. A plan looks to the future and is speculative in nature. It should demonstrate effort towards dissecting the research problem, identifying elements that seem straightforward versus those that may require extra effort. It's fine to identify elements where advice will be needed, too. An annotated bibliography should be appended, listing primary sources and essential secondary sources. I would expect the sources to be filtered at this point, but I would not expect they'd be closely read. Your goal should be to show you have a focus and a starting point.

*c. research paper (60%)*

This will be the complete research paper. Criteria for assessment will be provided.

Submit material via Moodle. *In extremis*, e-mail your essay to Prof Cain <j.cain@ucl.ac.uk> by the deadline.

## research paper: topics

For the research paper, your title options are below. Select one. Argue *for or against* one of these claims:

1. British scientists were complicit in perpetuating slavery during the 19thC.
2. British science was good for business in the nineteenth century. Use *one* of these cases: brewing, communication, or fashion.
3. Science was on display more than technology at the 1851 Great Exhibition in Hyde Park.
4. Science became a "new religion," and scientists the "new clerics," in the nineteenth century.
5. The Herschel family provides a new model for thinking about labour in 19thC circles of gentlemanly science.
6. Women drove a thriving "salon culture" of science in 19thC London.
7. Scientists became celebrities in the 19thC. Use *one* of these cases: William Buckland, Humphry Davy, Mary Anning, Florence Nightingale, Michael Faraday, Isambard Kingdom Brunel.
8. British colonial ambitions in the Pacific supported science activities in 19thC London.
9. Female authors dominated the writing of popular science books in the 19thC.
10. Pigeon fancying? There's no science in pigeon fancying in the 19thC.
11. The technology of railways was cloaked in non-scientific aesthetics in the 19thC.
12. Crime science was invented in 19thC London.
13. Forget abstract theory. Science in 19thC London was mostly about transport: speed and capacity.
14. Middle class women benefitted from the professionalization of science.
15. The Royal Navy is a better source for studying science's growth in the 19thC than the Royal Society.
16. Philip Henry Gosse provides a better model for studying science and religion in 19thC London than Thomas Henry Huxley.
17. Humans were displayed as *exotic* objects, not *racial* objects, in 19thC London.
18. Science became part of London's tourist landscape by the middle 19thC.
19. Scientists professionalized death in the 19thC.
20. London's aquarium craze in 1850s was unique internationally.
21. London gave mesmerism a scientific platform in the 19thC.

## supporting information

I encourage you to discuss your essay title with me well in advance, and frequently. Best to make an appointment. Your research must include primary sources. Citations should follow my guidance, both for printed and Web sources; detail is on the module Web site.

The assessment sheet I use while marking essays is available via the module Web site, for guidance purposes. Marks generally follow the departmental criteria for assessment. In sum, essays

will be assessed on the following terms:

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

My 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
- poor choice of sources (such as the *Encyclopaedia Britannica* or *Wikipedia*)

## Reading list

This is a complete list of readings, which are sourced via the module's Moodle site.

- Acland, Henry W., and John Ruskin. 2008 [1859]. *The Oxford Museum*. London: Euston Grove Press. [www.EustonGrove.com](http://www.EustonGrove.com)
- Alberti, Samuel. 2001. "Amateurs and Professionals in One County: Biology and Natural History in Late Victorian Yorkshire." *Journal of the History of Biology* 34:115-147.
- Allen, David Elliston. 1994. *The naturalist in Britain: a social history, 2nd edition*. Princeton: Princeton University Press.
- Allen, David Elliston. [1992] 2001. "The Victorian Fern Craze: Pteridomania Revisited." In *Naturalists and Society*, edited by David Elliston Allen, VI: 9-19. Aldershot, Hampshire: Ashgate.
- Allen, Michelle Elizabeth. 2008. *Cleansing the city: sanitary geographies in Victorian London*. Columbus, OH: Ohio State University Press.
- Ashton, Rosemary. 2008. *142 Strand: A Radical Address in Victorian London*. London: Vintage.
- Babbage, Charles. 1830. *Reflections on the Decline of Science in England, and on Some of its Causes*. London: Fellowes.
- Barton, Ruth. 1990. "An Influential Set of Chaps: The X-Club and Royal Society Politics, 1864-85." *British Journal for the History of Science* 23:53-81.
- Bellon, Richard. 2001. "Joseph Dalton Hooker's Ideals for a Professional Man of Science." *Journal of the History of Biology* 34 (1):51-82.
- Bellon, Richard. 2007. "Science at the Crystal Focus of the World." In *Science in the Marketplace: Nineteenth-Century Sites and Experiences*, edited by Aileen Fyfe and Bernard Lightman, 301-335. Chicago: University of Chicago Press.
- Brockway, Lucile. 1979. *Science and Colonial Expansion: The Role of the British Royal Botanic Gardens*. New Haven: Yale University Press.
- Carey, William. 1814. "Introduction." In *Hortus Bengalensis, or a catalogue of the plants growing in the honourable East India Company's botanic garden at Calcutta*, edited by William Roxburgh, i-xii. Calcutta: Mission Press.  
<https://www.biodiversitylibrary.org/bibliography/95337>
- Chadwick, Edwin. 1843. *Report on the sanitary conditions of the labouring population of Great Britain. A supplementary report on the results of a special inquiry into the practice of interment in towns. Made at the request of Her Majesty's principal secretary of state for the Home department*. London: HMSO.  
<https://archive.org/details/reportonsanitary00chadrich/page/n11>
- CPC. 1871. *Crystal Palace: Guide to the Palace and Park* London: Crystal Palace Company.
- Danzinger, Kurt. 1990. *Constructing the subject: historical origins of psychological research*. Cambridge: Cambridge University Press.
- Danzinger, Kurt. 1997. *Naming the Mind: How Psychology Found Its Language*. London: Sage Publications. <http://kurtdanziger.com/Naming%20the%20Mind.pdf>
- Davenport, Emma. 1863. *Fickle Flora and Her Seaside Friends*. London: Griffith and Farran.  
<https://tinyurl.com/davenport1863>
- Dawson, Gowan. 2016. *Show Me The Bone: Reconstructing Prehistoric Monsters in Nineteenth-Century Britain and America*. Chicago: University of Chicago Press.
- Dobraszczyk, P. 2009. *Into the Belly of the Beast: Exploring London's Victorian Sewers*. Reading: Spire.
- Faraday, Michael. [1861]. *The Chemical History of a Candle*. London: Chatto and Windus.

<https://tinyurl.com/faraday1861>

- Fraser, Robert W. 1868. *The Seaside Naturalist: Out-door Studies in Marine Zoology and Botany, and Maritime Geology*. London: Virtue and Co.
- Fyfe, Aileen. 2007. "Reading Natural History at the British Museum and the Pictorial Museum." In *Science in the Marketplace: Nineteenth-Century Sites and Experiences*, edited by Aileen Fyfe and Bernard Lightman, 196-230. Chicago: University of Chicago Press.
- Galton, Francis. 1872. "Statistical Enquiries into the Efficacy of Prayer." *Fortnightly Review* 68:125-135.
- Galton, Francis. 1906. "Cutting a round cake on scientific principles." *Nature* 75:173.
- Gibson, Susannah. 2015. *Animal, Vegetable, Mineral? How Eighteenth-Century Science Disrupted the Natural Order*. Oxford: Oxford University Press.
- Haller, John. 1971. *Outcasts from Evolution: Scientific Attitudes of Racial Inferiority, 1859-1900*. Carbondale, IL: Southern Illinois University Press.
- Hamlin, Christopher. 1997. *Public Health and Social Justice in the Age of Chadwick: Britain, 1800-1854*. New York: Cambridge University Press.
- Harte, Negley, John North, et al. 2018. *World of UCL. Third Edition*. London: UCL Press.  
<https://www.ucl.ac.uk/ucl-press/browse-books/the-world-of-ucl>
- Headrick, Daniel 1988. *The Tentacles of Progress : Technology Transfer in the Age of Imperialism, 1850-1940: Technology Transfer in the Age of Imperialism, 1850-1940*. Chicago: University of Chicago Press.
- Higgitt, Rebekah, and Charles W. J. Withers. 2008. "Science and Sociability: Women as Audience at the British Association for the Advancement of Science, 1831–1901." *Isis* 99 (1):1-27. doi: <https://doi.org/10.1086/587538>.
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<http://discovery.ucl.ac.uk/1462935/>
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<https://tinyurl.com/janko1995>
- Keighren, Innes, Charles Withers, et al. 2015. *Travels into Print: Exploration, Writing, and Publishing with John Murray, 1773-1859*. Chicago: University of Chicago Press.
- Knapp, Sandra, and Bob Press. 2005. *The Guided Canopy: Botanical Ceiling Panels of the Natural History Museum*. London: Natural History Museum.
- Kohlstedt, Sally Gregory. 1990. "Parlors, Primers, and Public Schooling: Education for Science in Nineteenth-Century America." *Isis* 81 (3):424-445. doi: <https://doi.org/10.1086/355454>.
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- Chicago: University of Chicago Press.
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- Marryat, Joseph. 1823. *Observations on the Application of the West India Dock Company for a Renewal of their Charter*. London: J.M. Richardson. <https://tinyurl.com/marryat1823>
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- Moore, James. 1985. "Darwin of Down: The Evolutionist as Squarson-Naturalist." In *The Darwinian Heritage*, edited by David Kohn, 435-481. Princeton, NJ: Princeton University Press.
- Moore, Wendy. 2017. *The Mesmerist: The Society Doctor Who Held Victorian London Spellbound*. London: Weidendeld and Nicolson.
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