HPSC1001 History of Science: Antiquity to Enlightenment

Course Syllabus

2012-13 session | Dr Simon Werrett | <u>s.werrett@ucl.ac.uk</u>

Course Information

Surveys the origins and development of science from the ancient Greeks to 1800. Main themes are the origins of science in the ancient world, the nature of the scientific revolution and the spread of science during the Enlightenment. Attend all lectures plus one tutorial per week.

Basic course information

Moodle	search 'HPSC1001'
web site:	
Assessment:	Two 1,800 word essays (25% each)
	One exam (50%)
Timetable:	www.ucl.ac.uk/sts/hpsc
Prerequisites:	No pre-requisites
Required texts:	None, but participants are expected to read all essential texts, as indicated in the syllabus.
Course tutor:	Matthew Paskins
Contact:	m.paskins@ucl.ac.uk t: 07891266227
Web:	www.ucl.ac.uk/silva/sts/staff/werrett
Office location:	22 Gordon Square, Room 1.2A
Office hours:	Tuesdays, 1-2pm
	Thursdays, 11-12am

UCL We	eek Topic	Date	Activity
	PART I - The Ancient World		
6	Introduction	October 2	None
6	The Beginnings of Science	October 4	Read Essential Reading
6	Tutorial 1	October 5	
7	Early Greek Science	October 9	Read Essential Reading
7	Plato and Aristotle	October 11	Read Essential Reading
7	Tutorial 2	October 12	
8	Chinese and Arabic Science	October 16	Read Essential Reading
8	The European Revival	October 18	Read Essential Reading
8	Tutorial 3	October 19	
	PART II - The Scientific Revolution		
9	Renaissance Science	October 23	Read Essential Reading
9	Science at Court	October 25	Read Essential Reading
9	Tutorial 4	October 26	
10	Galileo, Science, and Religion	October 30	Read Essential Reading
10	Science and Art	November 2	Read Essential Reading
10	Tutorial 5	November 3	
10	Essay 1 deadline	Friday 2 November	
11	Reading Week	5 to 9 November	
12	Scientific Instruments	November 13	Read Essential Reading
12	The Mechanical Philosophy	November 15	Read Essential Reading
12	Tutorial 6: Object Lessons	November 16	-

Schedule

HPSC1001 History of Science

2012-13 session Dr Simon Werrett s.werrett@ucl.ac.uk

13	Newton: The Last Sorceror?	November 20	Read Essential Reading
	PART III: The Enlightenment		
13	Natural History in the Eighteenth Century	November 22	Read Essential Reading
13	Tutorial 7: Visit the Grant Museum	November 23	
14	Science and the Enlightenment	November 27	Read Essential Reading
14	Women in Science	November 29	Read Essential Reading
14	Tutorial 8	November 30	
15	Science and Empire	December 4	Read Essential Reading
15	Revolutions: Industrial and Chemical	December 6	Read Essential Reading
15	Tutorial 9	December 7	
16	Science and Romanticism	December 11	Read Essential Reading
16	Conclusion and Review	December 13	None
16	Tutorial 10	December 14	
16	Essay 2 deadline	Friday 14 December	

Assessment

Assessment for the course is by means of two essays and an exam. The essays are each worth 25% of the overall mark, and the exam 50%.

Summary

	Description	Deadline	Word limit
Essay 1	History Essay	11.59 pm Friday 2 November	1,800
Essay 2	Objects Essay	11.59pm Friday 14 December	1,800

Assignments

Essays must be submitted via Moodle only.

All course work must be completed for a student to be eligible to sit the examination. To complete the

course, all course work must be completed and the student must sit the examination.

Criteria for assessment

The departmental marking guidelines for individual items of assessment can be found in the STS Student Handbook.

Essay 1: History Essay (25%)

Answer ONE of the following questions:

(1) Would it be accurate to say that European science was the only important scientific tradition prior to the Scientific Revolution?

(2) What differences and similarities were there between Copernicus' new astronomy and what preceded it?

(3) Why was the court an important institution for science during the Renaissance?

(4) Would it be accurate to say that science and religion were in conflict between the eleventh and seventeenth centuries?

Essay 2: Objects Essay (25%)

For your second assignment, you should choose an object clearly related to natural science or medicine and which was created between 1600 and 1800. If you are unsure that an object is clearly related to science or medicine, or made in that period, ask Dr. Werrett. You can choose an object from the locations listed below, which you are encouraged to visit outside class time. If you find something in a location that is not listed, ask Dr. Werrett before proceeding. Once you have decided on your object, you should attempt to answer as many as possible of the following questions:

- 1. What is the object? (What is it called? What is its function? What is it made of? When was it made? Describe how it is constructed)
- 2. Who made this object? (Who was the instrument maker, and if the piece is anonymous, who might have made it? Where did they make it? What methods were used to make it? Were these makers or their methods novel or innovative? Were the profession or its methods enduring or short-lived? Where, generally, were these sorts of objects made and by whom?)
- 3. Describe the use of this object (Who typically owned or used this object and how did they get hold of the object? Where was the object kept? How was it used? How did its use change in the decades before and after your particular object was made?)
- 4. How was the object understood by its users? (How did they think it worked, and what did they think it could do? In what historical context did it become important, and did its use decline or increase due to changing historical circumstances?)
- 5. Why is this object of relevance to the history of science? (Did this object provide new evidence for scientific theories? Did this object allow people to understand nature in a new or different way? What was its significance/ importance for science?)
- 6. Try to include at least one photograph or image of your object in your essay.

In weeks 9 to 13, you will be given guidance on how to research and write about objects, and we will be

visiting several local museums to investigate objects in their collections and hear from local experts.

Places to find Objects:

Wellcome Collection (on Euston Rd at the top of Gordon St; to join the library take a proof of address and picture ID such as your UCL student card)

First Floor – "Medicine Man" exhibit – a sample of the collections of Henry Wellcome. Includes e.g. a bleeding bowl (c. 1700), recipe books, a lodestone, eighteenth-century spectacles, a guillotine blade, a microscope, and various paintings of medical interest).

Wellcome Library – located on second floor – this is an excellent library of works on history of science and medicine, and a useful place to do research. The rare books collection contains many early modern texts of relevance to the course.

British Museum (go to the bottom of Gower St and take a left onto Great Russell St for the entrance)

Ground Floor – "Enlightenment" gallery contains numerous cabinets of instruments and specimens from eighteenth-century British science, especially items connected with Hans Sloane, Joseph Banks and Captain Cook, relevant to lectures on natural history in the eighteenth century, and on science and empire. Also items belonging to the magician John Dee and an "alchemist's knife". Case 14 includes a Maria Sybilla Merian book of watercolours of insects.

Upper floor, room 38 - early modern clocks in the Sir Harry and Lady Djanogly Gallery of Clocks and Watches. Watch the video explaning how the Cassiobury Park clock works. Clockwork was an inspiration for the "mechanical philosophy".

British Library (go to the top of Gower St and turn right onto Euston Rd. BL is located just before St. Pancras station. You don't need a reader's ticket to see the permanent exhibition gallery).

Permanent exhibition gallery – contains some scientific books, including a Chinese book on pharmacy, c. 1603; and Galileo's *Sidereus Nuncius*, 1610.

Science Museum (go to South Kensington tube, or take the number 14 bus from Gower Street)

Ground Floor – "James Watt and Our World" - cabinets containing items from James Watt's workshop.

Ground Floor – "Making the Modern World" – the first two glass cases along the wall contain eighteenth-century scientific instruments, including electrical instruments, navigation instruments, measuring instruments, a microscope and chemical apparatus.

Third Floor – "Science in the Eighteenth Century" – a collection of instruments made by Stephen Demainbray in the late eighteenth century for King George III. These include several large orreries, telescopes, navigation instruments, microscopes, demonstration apparatus, magnets, models, globes, and electrical machines. There is also a replica of Robert Boyle's Air Pump. Relevant to lectures on scientific instruments and public science in the eighteenth century.

Fifth Floor – "The Science and Art of Medicine" – while most exhibits relate to medicine, there is

much of interest here, including seventeenth-century microscopes and telescopes, magical amulets, and chemical apparatus belonging to Joseph Priestley.

National Maritime Museum & Royal Greenwich Observatory (take the DLR direct from Euston to Cutty Sark)

Royal Greenwich Observatory: numerous astronomical instruments, and John Harrison's marine chronometers, used to solve the longitude in the eighteenth century.

Maritime Museum: Ground Floor – "Explorers: the Americas and the North-West Passage" – articles relating to the history of exploration, including Cook's voyages. Further items may be found on the second floor in the exhibit "Navigators: 1100 to now"

Neptune Court = "Upper Deck Gallery" – glass cabinets of scientific instruments, including astrolabes, telescopes, and navigation instruments.

Aims of the Course

The general aim of the course is to present an overview of the History of Science from the beginnings up to the end of the eighteenth century. The course does not require any technical knowledge of current science. It is intended to function both as a course in its own right and as a foundation for other courses in Science and Technology Studies. It is hoped that a study of the origins and development of science will provide a better understanding of what science is now. The course is divided into three time periods, The Ancient World, The Scientific Revolution and The Enlightenment, and it is hoped that you will learn something of the scientific zeitgeist as well as the major advances of those periods; you will have to answer one question on each period in the exam.

Objectives of the Course

By the end of the course, it is hoped that you will have acquired :

- * A working knowledge of the history of science up to 1800 an in-depth knowledge of one topic and one object from that period, demonstrated in essays and exam answers.
- * Key essay writing skills; the ability to select the most important facts, to marshal those in argument and an awareness of the strengths and weaknesses of that argument.
- * Some basic historiographical skills; an awareness of anachronism and the basic methods of writing the history of science.

Lectures

The lectures will give you the backbone of the course material. You will find it very helpful to read the background reading material prior to the relevant lecture. Questions are encouraged during lectures. An outline of the lecture will be available on the class Moodle site by the evening before each lecture, and additional information may be posted to the Moodle site when appropriate. When possible, powerpoints and images (or links to images) from each lecture will be posted on the Moodle site.

Tutorials

Please use the tutorials to discuss the lecture material in more depth. Discussion is of considerable

importance in helping you to understand the material at a greater depth and in fixing the material from the lectures in your mind. Tutorials are far better for the students (and far easier to run !) if you participate in them actively. Ask questions and raise issues that interest you, and feel free to discuss ideas for essays and any aspect of essay writing technique.

Readings and Resources on Moodle

Readings are divided between "essential" and "additional". There is one essential reading for each lecture, and several additional readings. Each week, you should make sure you have read the essential readings in time for the tutorial at the end of the week. The examination will be based on the essential readings. You are encouraged to read the additional readings, and you should make use of them in the first instance (i.e. before turning to other sources) to write your essays. Additional resources will be made available on the course Moodle site during the term. You are not obliged to make use of these, but you are encouraged to do so.

Office Hours

I will be glad to answer any questions related to the course. If you wish to see me on a one - to - one basis to discuss essay questions, or discuss anything you haven't understood or would like to go over again, or anything else in relation to the course, I will be pleased to see you during my office hours, which are Tuesdays 1-2 and Thursdays 11-12. I guarantee I will be there and available to talk about this course during those times; you are of course welcome to try me at other time though I cannot guarantee I will be free.

E-Mail

You are welcome to email me questions, and I shall try to answer them in a timely fashion. But please be aware that this is not always possible, particularly during the evening and at weekends. You should email Dr. Werrett with questions, and not Mat Paskins, unless he indicates otherwise.

Reading list

Week 6

October 2 – Lecture 1 – Introduction

No readings for this lecture

October 4 – Lecture 2 – The Beginnings of Science

Essential: Patricia Fara, *Science: A Four Thousand Year History* (Oxford: Oxford University Press, 2009), 8-15 (DIGITIZED)

Additional:

A.L. Oppenheim, "Man and Nature in Mesopotamian Civilisation," in *The Dictionary of Scientific Biography*, ed. C.C. Gillispie Vol. 15 pp. 634-666. (DIGITIZED)
 O. Neugebauer, "The History of Ancient Astronomy," *Journal of Near Eastern Studies* 4 (1945). (JSTOR)

(3) David Lindberg, *The Beginnings of Western Science* (Chicago: Chicago University Press, 2008), chapter 1.
(4) "Celestial Forecasting" in Stephen Toulmin, June Goodfield, *The Fabric of the Heavens* (1961), pp. 27-58. (DIGITIZED)

Week 7

October 9 - Lecture 3 – Early Greek Science

Essential: G. E. R. Lloyd, "The criticism of magic and the inquiry concerning nature" in his *Magic, Reason and Experience* (Cambridge, 1979), chapter 1. (DIGITIZED)

Additional: (1) Karl Popper, "Back to the Presocratics," in his *Conjectures and Refutations*. pp. 136-165. (DIGITIZED)
(2) A. D. Gregory, "The first scientific theories" in his *Eureka ! The Birth of Science* (Icon, 2000), Ch. 2, pp. 23-46. (DIGITIZED)
(3) David Lindberg, *The Beginnings of Western Science* (Chicago: Chicago University Press, 2008), chapter 2.
(4) G. E. R. Lloyd, *Early Greek Science: Thales to Aristotle* (New York, 1974).

October 11 – Lecture 4 – Aristotle and Plato

Essential: G. E. R. Lloyd, "The physics of the heavenly region" in his *Aristotle: The Growth and Structure of his Thought*, Ch. 7. (DIGITIZED)

Additional: (1) S. Sambursky, "The cosmos of Aristotle" in his *The Physical World of the Greeks* (London, 1956), Ch. 4. (DIGITIZED)
(2) Plato, *Timaeus* (INTERNET CLASSICS ARCHIVE)
(3) A. George Molland, "Aristotelian Science" in *Companion to the History of Modern Science* (E-BOOK)
(4) David Lindberg, "Aristotle's Philosophy of Nature" in his *The Beginnings of Western Science* (Chicago, 2007), 45-66.

Week 8

October 16 - Lecture 5 - Chinese and Arabic Science

Essential: David Lindberg, *The Beginnings of Western Science* (Chicago: Chicago University Press, 2008), chapter 8 (DIGITIZED)

Additional: (1) Nathan Sivin, "Why a Scientific Revolution did not take place in China, or didn't it?" <<u>http://ccat.sas.upenn.edu/~nsivin/writ.html</u>>

(2) Nathan Sivin, "State, Cosmos, and Body in the Last Three Centuries BC." *Harvard Journal of Asiatic Studies* 55 (1995): 5-37 (JSTOR).

(3) Patricia Fara, *Science: A 4000 Year History* (Oxford: Oxford University Press, 2009), 43-60.

(4) S. Nomanul Haq, "That Medieval Islamic Culture Was Inhospitable to Science," in in Ronald L. Numbers, ed., *Galileo Goes To Jail and Other Myths About Science and Religion* (Cambridge, MA: Harvard University Press, 2009)

October 18– Lecture 6 – The European Revival

Essential: Michael H. Shank, "That the Medieval Christian Church Suppressed the Growth of Science" in in Ronald L. Numbers, ed., *Galileo Goes To Jail and Other Myths About Science and Religion* (Cambridge, MA: Harvard University Press, 2009) (DIGITIZED)

Additional: (1) Pearl Kibre and Nancy G. Sirasi, "The Institutional Setting: The Universities," in David Lindberg, ed., *Science in the Middle Ages*, pp. 120-144 (DIGITIZED) (2) John Hedley Brooke, *Science and Religion: Some Historical Perspectives* (Cambridge: Cambridge University Press, 1991), chapter 1 (DIGITIZED) (3) David Lindberg, *The Beginnings of Western Science* (Chicago: Chicago University

(3) David Lindberg, *The Beginnings of Western Science* (Chicago: Chicago University Press, 2008), chapter 9 to 10.

(4) Robert Bartlett, *The Natural and the Supernatural in the Middle Ages* (Cambridge University Press, 2008), chapter 2.

Week 9

October 23 - Lecture 7 - Renaissance Science

Essential: Peter Dear, *Revolutionizing the Sciences: European Knowledge and Its Ambitions, 1500-1700,* second ed. (Princeton, NJ: Princeton University Press, 2009), chapter 2 (DIGITIZED)

Additional: (1) John Henry, "Why did Copernicus say the Earth moves?" in his *Moving Heaven and Earth* (Cambridge, 2001), pp. 12-55 (DIGITIZED)
(2) William Donahue, "Astronomy" in *The Cambridge History of Science Vol. 3 Early Modern Science* (E-BOOK)
(3) J. R. Ravetz, "The Copernican Revolution" in Olby et al, eds., *Companion to the History of Modern Science* (E-BOOK)
(4) I. B. Cohen, *The Birth of a New Physics* (Penguin, 1992)

October 25 - Lecture 8 – Science at Court

Essential: Bruce Moran, "Courts and Academies" in *The Cambridge History of Science Vol. 3 Early Modern Science* (E-BOOK).

Additional: (1) Paula Findlen, "Jokes of Nature and Jokes of Knowledge" *Renaissance Quarterly* 43 (1990): 292-331 (JSTOR).

(2) Lorraine Daston, "Curiosity in Early Modern Science," *Word and Image* 11 (1995): 391-404 (E-JOURNAL).

(3) Pamela H. Smith, "Alchemy as a Language of Mediation at the Hapsburg Court," *Isis* 85 (1994): 1-25 (JSTOR).

(4) Mario Biagioli, "Galileo's System of Patronage" History of Science 28 (1990): 1-62.

Week 10

October 30 - Lecture 9 - Galileo, Science, and Religion

Essential: Stillman Drake, "Conflicts with astronomers and theologians," in his *Galileo* (Oxford University Press, 1980), chapter 4 (DIGITIZED)

Additional: (1) N. Swerdlow, "Galileo's discoveries with the telescope and their evidence for the Copernican theory" in *The Cambridge Companion to Galileo*, ed. Peter K. Machamer (Cambridge, 1998) (DIGITIZED)
(2) Peter Barker and Bernard R. Goldstein, "Theological Foundations of Kepler's Astronomy," *Osiris* 16 (2001): 88-113 (JSTOR)
(3) Maurice A. Finocchiaro, "That Galileo was imprisoned and tortured for advocating Copernicanism," in Ronald L. Numbers, ed., *Galileo Goes To Jail and Other Myths About Science and Religion* (Cambridge, MA: Harvard University Press, 2009), 68-78.
(4) John Hedley Brooke, *Science and Religion: Some Historical Perspectves*, chapters 2-3.

November 1 – Lecture 10 – Science and Art

Essential: Paolo Rossi, "Bacon's Idea of Science" in Markku Peltonen, ed., *The Cambridge Companion to Bacon* (Cambridge) (DIGITIZED)

Additional:

(1) Steven Shapin, "The House of Experiment in Seventeenth-Century England" Isis 79 (1988): 373-404 (JSTOR)
 (2) Pamela H. Smith, "Laboratories," in *The Cambridge History of Science Vol. 3 Early Modern Science* (E-BOOK)
 (3) Peter Dear, *Revolutionizing the Sciences*, chapter 3.
 (4) Francis Bacon, *New Atlantis* (1627)
 http://oregonstate.edu/instruct/phl302/texts/bacon/atlantis.html>

Week 11

Reading Week - November 5 to November 9

Week 12

November 13 - Lecture 11 - Scientific Instruments

Essential: Catherine Wilson, "Visual Surface and Visual Symbol: the Microscope and the Occult in Early Modern Science", *Journal of the History of Ideas*, vol. 49, no.1 (1988): 85-108 (JSTOR)

Additional: (1) Albert Van Helden, "The Telescope in the Seventeenth Century" *Isis* 65 (1974) (JSTOR)

(2) Deborah Jean Warner, "What is a Scientific Instrument? When did it become one, and why?" *British Journal for the History of Science* 23 (1990): 83-93 (JSTOR).
(3) Jim Bennett, "Presidential Address: Knowing and Doing in the Sixteenth Century: What Were Instruments For?," *British Journal for the History of Science* 36 (2003): 129-

150 (JSTOR)

(4) Thomas Hankins and Robert Silverman, "Athanasius Kircher's Sunflower Clock" in their *Instruments and the Imagination* (Princeton, N. J.: Princeton University Press, 1995), chapter 2.

November 15 – Lecture 12 – The Mechanical Philosophy

Essential: Simon Werrett, "Wonders Never Cease: Descartes's Météores and the Rainbow Fountain" British Journal for the History of Science 34 (2001): 129-147 (JSTOR)

Additional: (1) D. Clarke, "Descartes' Philosophy of Science and the Scientific Revolution," in *The Cambridge Companion to Descartes*, ed. John Cottingham (Cambridge, 1992) (DIGITIZED)
(2) Keith Hutchison, "What happened to Occult Qualities in the Scientific Revolution?" *Isis*, 73 (1982) (JSTOR)
(3) Martin Tamny, "Atomism and the Mechanical Philosophy" in Olby et al, eds., *Companion to the History of Modern Science*, 597-609 (E-BOOK).
(4) Peter Dear, *Revolutionizing the Sciences*, chapter 5.

November 16 – Tutorial 6 – Object Lessons. A discussion of researching and writing about objects with contributions from UCL Museums & Public Engagement teaching fellow Leonie Hannan.

Week 13

November 20 – Lecture 13 – Newton: The Last Sorceror?

Essential: David Kubrin, "Newton and the Cyclical Cosmos" (1967) *Journal of the History of Ideas* 28 (1967): 325-346 (JSTOR).

Additional: (1) Betty Jo Teeter Dobbs, "Newton's Alchemy and his Theory of Matter" *Isis* 73 (1982) (JSTOR)

(2) John Henry, "Magic and Science in the Sixteenth and Seventeenth Centuries" in Olby et al, eds., *Companion to the History of Modern Science*, 583-596 (E-BOOK).
(3) Alan Gabbey, "Newton and Natural Philosophy" in Olby et al, eds., *Companion to the History of Modern Science*, 243-263 (E-BOOK).

(4) William R. Newman, "From alchemy to 'chemistry'," in *The Cambridge History of Science Vol. 3 Early Modern Science* (E-BOOK).

November 22– Lecture 14 – Natural History in the Eighteenth Century

Essential: Peter J. Bowler, "Nature and the Enlightenment" in his *Fontana History of the Environmental Sciences* (London: Fontana, 1992), chapter 5 (DIGITIZED)

Additional: (1) Phillip R. Sloan, "Natural History, 1670-1802" in Olby et al, eds., *Companion to the History of Modern Science*, 295-313 (E-BOOK).
(2) Lisbet Koerner, "Linnaeus' Floral Transplants," *Representations* 47 (1994): 144-169 (JSTOR).

(3) Thomas Hankins, "Natural History and Physiology" in his Science and the

Enlightenment (Cambridge, 1985), chapter 5 (DIGITIZED).

(4) Simon Schaffer, "Herschel in Bedlam: Natural History and Stellar Astronomy," *British Journal for the History of Science* 13 (1980): 211-239 (JSTOR)

November 23 - Tutorial 7 – Visit to the Grant Museum. You should arrive at the museum at your designated tutorial time (i.e. 2pm or 3pm). The Grant Museum is on Gower Street but note that the entrance is at 21, University Street. There is a link to a map and instructions on how to get there on the 1001 Moodle site.

Week 14

November 27 – Lecture 15 – Science and the Enlightenment

Essential: Peter Hanns Reill, "The Legacy of the Scientific Revolution: Science and the Enlightenment," in *Cambridge History of Science vol. 4: Eighteenth-Century Science* (DIGITIZED)

Additional: (1) John Heilbron, "The Case of Electricity" in his *Elements of Early Modern Physics* (Berkeley, London: University of California Press, 1982), 159-240 (DIGITIZED)
(2) Larry Stewart, "Public Lectures and Private Patronage in Newtonian England," *Isis* 77 (1986): 47-58 (JSTOR)
(3) Patricia Fara, "Marginalized Practices," in *Cambridge History of Science vol. 4: Eighteenth-Century Science* (E-BOOK)
(4) Simon Schaffer, "Natural Philosophy and Public Spectacle in the Eighteenth Century," *History of Science* 21 (1983): 1-43.

November 29 - Lecture 16 - Women in Science

Essential: Londa Schiebinger, "The Anatomy of Difference: Race and Sex in Eighteenth-Century Science" *Eighteenth-Century Studies* 23 (1990): 387-405 (JSTOR)

Additional: (1) Paula Findlen, "Science as a Career in Enlightenment Italy: The Strategies of Laura Bassi," *Isis* 84 (1993): 441-469 (JSTOR).

(2) Londa Schiebinger, "Women of Natural Knowledge" in *The Cambridge History of Science Vol. 3 Early Modern Science*, 192-205 (E-BOOK)

(3) Londa Schiebinger, "The Philosopher's Beard: Women and Gender in Science," in The Cambridge History of Science vol. 4: Eighteenth-Century Science, 184-210 (E-BOOK)
(4) John Christie, "Feminism in the History of Science," in Olby et al, eds., Companion to the History of Modern Science (E-BOOK).

Week 15

December 4 – Lecture 17 – Science and Empire

Essential: Sujit Sivasundaram, "Sciences and the Global: On Methods, Questions, and Theory," *Isis* 101 (2010): 146-158 (JSTOR).

Additional:

(1) Rob Iliffe, "Science and Voyages of Discovery" in Cambridge History of Science vol. 4:

Eighteenth-Century Science (E-BOOK)

(2) Larry Stewart, "Global pillage: science, commerce and Empire" in *Cambridge History* of Science vol. 4: Eighteenth-Century Science (E-BOOK)

(3) James Delbourgo, "Sir Hans Sloane's Milk Chocolate and the Whole History of the Cacao," *Social Text 106* vol. 29 (2011): 71-101.

<<http://history.rutgers.edu/index.php?option=com_content&task=view&id=307&Ite mid=140>>

(4) Patricia Fara, *Sex, Botany, and Empire: The Story of Carl Linnaeus and Joseph Banks* (Cambridge: Icon, 2003).

December 6 - Lecture 18 - Revolutions: Industrial and Chemical

Essential: Maurice Crosland, "Chemistry and the Chemical Revolution," in Roy Porter, G. S. Rousseau, eds., *The Ferment of Knowledge* (Cambridge University Press, 1980) (DIGITIZED)

Additional:

Jan Golinski, "Chemistry" in *Cambridge History of Science vol. 4: Eighteenth-Century Science* (E-BOOK)
 Joel Mokyr, "The Intellectual Origins of Modern Economic Growth," *Journal of Economic History* 65 (2005): 285-351 (JSTOR).
 Lissa Roberts, "The Death of the Sensuous Chemist" *Studies In History and Philosophy of Science Part A* 26 (1995): 503-529 (E-JOURNAL)
 Maurice Crosland, "Antoine-Laurent Lavoisier: The Chemical Revolution" in Roy Porter, ed., *Man Masters Nature: 25 Centuries of Science* (London: BBC Books, 1987) (DIGITIZED)

Week 16

December 11– Lecture 19 – Science and Romanticism

Essential: David Knight, "Romanticism and the Sciences," in Andrew Cunningham and Nicholas Jardine, eds., *Romanticism and the Sciences* (Cambridge University Press, 1990), 13-24 (DIGITIZED)

Additional: (1) David Knight, "German Science in the Romantic Period" in Maurice Crosland, ed., *The Emergence of Science in Western Europe* (London: Macmillan, 1975), 161-178 (DIGITIZED).

(2) Richard Holmes, *The Age of Wonder: The Romantic Generation and the Discovery of the Beauty and Terror of Science* (London: HarperPress, 2008), chapter 8 (DIGITIZED).
(3) Michael Dettelbach, "Alexander von Humboldt between Enlightenment and Romanticism," *Northeastern Naturalist* 8 (2001): 9-20 (JSTOR).

(4) Malcolm Nicholson, "Alexander von Humboldt and the Geography of Vegetation," in Jardine and Cunningham, eds., *Romanticism and the Sciences*, 169-188.

December 13 - Lecture 20 - Review and Conclusions

No readings are required for this class.

Course expectations

You are expected to attend all lectures and all tutorials. A record will be kept of your attendance. Failure to regularly attend lectures or tutorials may result in you being withdrawn from the course, barred from the examination, or both. We must be able to certify to the College that you have seriously engaged the course content. The STS Undergraduate Tutor reserves the right to bar from examinations students not meeting attendance criteria specified in the UCL Student Handbook or by the Course Tutor at the start of term.

You are expected to read all of the essential readings. Be prepared to discuss them in the tutorials. You should have copies of the week's essential readings available to you to refer to in the tutorial at the end of the week. You are encouraged to read the additional readings for each lecture, and when answering essay questions you are expected to make use of as many of these as possible in the first instance (i.e. before turning to any other sources).

Important policy information

Below are listed some important points of policy. Further details of all these policies can be found in the STS Student Handbook <u>www.ucl.ac.uk/sts/handbook</u>

Late submission of coursework

Penalties for late coursework submission are as follows:

- Ioss of 5 marks for work submitted less than 24 hours late
- Ioss of 15 marks for work submitted between 1 and 7 days late
- loss of all marks (i.e. work is graded 0) if submitted more than 7 days late These rules are statutory and non-negotiable.

Coursework word limits

Penalties for over-length coursework are as follows:

- Assessed work should not be more than 10% longer than the prescribed word count. Assessed work with a stated word count above this maximum cannot be accepted for submission, but will be immediately returned to the student with instructions to reduce the word length. The work may then be resubmitted, except insofar as penalties for late submission may apply.
- If submitted work is subsequently found to have an inaccurately stated word count, and to exceed the upper word limit by at least 10% and by less than 20%, the mark will be reduced by ten percentage marks, subject to a minimum mark of a minimum pass assuming that the work merited a pass.
- For work which exceeds the upper word limit by 20% or more, a mark of zero will be recorded.
- Footnotes and endnotes do count as part of the word limit
- Bibliography, tables, pictures and graphs **do not** count as part of the word limit.

Extensions

If unforseeable circumstances prevent the completion of a piece of coursework, students may request an extension to the set deadline. Please consult the STS Student Handbook for further guidance on acceptable grounds for requesting an extension. Extensions must be negotiated in advance with the course tutor. Students to whom STS is parent department may also request an extension from their Personal Tutor. No extension is considered official without written approval.

The request for extension form can be found at: www.ucl.ac.uk/sts/study

Plagiarism

The UCL Student Handbook defines plagiarism as "the presentation of another person's thoughts or words or artefacts or software as though they were [your] own". Students are expected to know the College and Department policies in detail and to avoid even the appearance of inappropriate behaviour. In the first demonstrated instance of plagiarism or other irregularities in this course, students normally will receive a 0 F for the course and will be referred to the department and College officials for further action. All course work is subject to scrutiny against past papers and other materials for irregularities. Electronic and other checks will be conducted; see the *STS student handbook* for additional information.

Attendance

Regular attendance is mandatory.

Requirements to complete modules

Students are required to be 'complete' in all modules. Normally all assignments must be attempted in order for students to be considered complete. This is different from 'passing' a module which requires a minimum overall module mark of 40%.

Assessment and additional examiners

Assessed materials are marked by the course tutors. These provisional marks will be distributed to students at the first opportunity. To ensure fairness, materials subsequently are scrutinised by a second examiner within the Department, and a consensus is reached on these separate assessments. All assessed materials and the consensus marks are made available for scrutiny by an examiner external to UCL. Marks are considered final only after the Board of Examiners for Science and Technology Studies has approved them in their annual meeting near the close of Term three.

Disputed marks

Students must endeavour to discuss any grievances over marks informally with the course tutor in the first instance. If informal discussion fails to resolve the matter satisfactorily and there appears to be genuine and substantive grounds for appeal, the student should submit a written explanation of their grievance to the chair of the board of examiners. A final formal written appeal can be made to the College Registrar.

Mechanisms for student feedback

Students have a variety of means for commenting on the module and module tutor. These include written module evaluations at the end of term, regular lecture assessments offered by the module tutor, and in-session opportunities. Students are welcome to bring comments and criticisms to the module tutor in the first instance, by anonymous note if necessary, then to their personal tutor or the STS undergraduate tutor. The department schedules regular meetings of the Undergraduate Student Staff Consultative Committee to which all students are invited.