

30 May 2008 1.30 to 4.30

HISTORY AND PHILOSOPHY OF SCIENCE (1)

Classical Traditions in the Sciences

Before you begin read these instructions carefully:

*Answer **four** questions: answer **one** question chosen from **Section A** and **three** questions chosen from **Section B**.*

Begin each answer on a separate sheet.

*Write legibly and on only **one** side of the paper.*

Answers must be tied up in separate bundles, marked 1, 2, 3, etc. according to the number of the question.

*Attach a completed coversheet to each bundle and complete a master coversheet listing all questions attempted. It is essential that you write your examination number and **not** your name on the coversheet and on **each** bundle.*

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Paper 1: Classical Traditions in the Sciences

SECTION A

1. When did the classical traditions in the sciences end, and why?
2. What were the social contexts of mathematics and the sciences before 1600?
3. What are the characteristics of **either** a scientific **or** a mathematical text pre-1600?

SECTION B

4. What was the role of divination in ancient Assyria?
5. How was the patronage of science affected by the rise of Islam?
6. Some historians have claimed that there was a shift from mythological to rational explanation amongst the ancient Greeks. To what extent do Greco-Roman authors show evidence of such a shift?
7. Aristotle claimed that “Homer and Empedocles have nothing in common but meter; so while it is right to call the one a poet, the other should be called a physicist, rather than a poet.” What did he mean by that? Was he right?
8. How far, if at all, can the differences between investigations into the natural phenomena in ancient Greece and China be related to the differences in the institutional framework within which the investigators worked?
9. **Either** (a) What were the major themes of Arabic traditions in mathematics between the 9th and 11th centuries?
Or (b) How did Kamal al-Din reconcile mathematics and natural philosophy in his study of the rainbow?
10. How were instruments used to model the heavens in medieval Europe?
11. Are pre-modern maps best characterised by an increasing level of “accuracy and observation”?
12. Why, if at all, did Christians study nature before 1600?

END OF PAPER

28 May 2008 9.00 to 12.00

HISTORY AND PHILOSOPHY OF SCIENCE (2)

Natural Philosophies: Renaissance to Enlightenment

Before you begin read these instructions carefully:

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Paper 2: Natural Philosophies: Renaissance to Enlightenment

SECTION A

1. What was the role of printed books in the production of early modern natural knowledge?
2. Was there a Scientific Revolution between 1550 and 1800?
3. What problems are posed to the historian concerning the survival of material evidence from the period 1550-1800?

SECTION B

4. **Either** (a) How did early modern experimental philosophers justify their work?
Or (b) “The divisions of knowledge are like branches of a tree that meet in one stem” (FRANCIS BACON). Discuss the significance of the utility of the sciences for Bacon’s reform of knowledge.
5. Compare and contrast the views of matter held by Bacon and by Descartes.
6. **Either** (a) What changes characterise the development of astronomical observatories between 1550 and 1800?
Or (b) Why was Western astronomical learning so useful to the Kangxi Emperor?
7. **Either** (a) Why was the generation of living beings so controversial an investigative problem in the eighteenth century?
Or (b) Why was the classification of living beings so controversial an activity in the eighteenth century?
8. **Either** (a) What is to be learnt from comparing the Lunar Society and the Royal Society of London in the same period?
Or (b) How significant were communication networks to the pursuit of early modern natural philosophy?
9. How significant was the role of instruments in the development of trade, navigation and voyages of discovery?

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Paper 2: Natural Philosophies: Renaissance to Enlightenment (cont.)

10. “Alchemists worked at royal courts, astrologers in urban markets.” How sustainable is this generalisation?
11. What did eighteenth-century cabinets of natural history display, and to whom?
12. **Either** (a) Did science and magic become incompatible in early modern Europe?
Or (b) How did the early modern natural philosophers encounter the problem of nature’s occult workings, and what range of responses did they produce?

END OF PAPER

29 May 2008 9.00 to 12.00

HISTORY AND PHILOSOPHY OF SCIENCE (3)

Science, Industry and Empire

Before you begin read these instructions carefully:

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Paper 3: Science, Industry and Empire

SECTION A

1. In what ways was science an imperial enterprise in the nineteenth century?
2. How dependent was the development of the nineteenth-century sciences upon the introduction of new instruments?
3. How did quantification change nineteenth-century science?

SECTION B

4. Why were scientific teaching laboratories established in the nineteenth century? What were their effects?
5. How and why did the ways that race was investigated change in the nineteenth century?
6. Why did maps have such a central role in nineteenth-century geology?
7. **Either** (a) “Darwinists are not necessarily hoofed and horned monsters, but . . . may even be detected in the act of going to church” (LESLIE STEPHEN, 1873). Discuss.
Or (b) What Darwin believed has been subject to debate for nearly a century and a half. Why?
8. Why did the sciences become such a significant cultural battleground in Britain in the years around 1830?
9. The nineteenth-century novel was a medium for exploring the possibilities and responsibilities of scientific experimentation. Discuss using examples from **two** of the following: *Frankenstein*; *Middlemarch*; *Heart and Science*.
10. **Either** (a) What did the discovery of ancient Assyria contribute to debates over the age of the earth?
Or (b) What drove the transformation of Biblical archaeology into “Assyriological science” over the second half of the nineteenth century?
11. What effects did the popularity of exhibitions have on nineteenth-century public perceptions of science?
12. Compare and contrast the importance of steam engines and of electric telegraphs in Victorian physical sciences.

END OF PAPER

30 May 2008 9.00 to 12.00

HISTORY AND PHILOSOPHY OF SCIENCE (4)

Metaphysics, Epistemology and the Sciences

Before you begin read these instructions carefully:

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Paper 4: Metaphysics, Epistemology and the Sciences

SECTION A

1. Assume we made contact with extra-terrestrials and their physics turned out to be like ours. Would this vindicate scientific realism?
2. “Philosophy of science is important because it makes explicit what in the thought of practicing scientists is merely implicit (or unconscious).” Discuss.
3. “The metaphysics and epistemology of the sciences are inseparable.” Discuss.

SECTION B

4. How can natural selection favour traits that reduce fitness?
5. “Truth is the outcome of inquiry.” Discuss.
6. How would you distinguish between the factual and the conventional parts of a physical theory?
7. “The intentions of speakers to use a name to refer to something must be allowed to count in determining what it denotes” (GARETH EVANS). Discuss.
8. Does rigid designation work across paradigms?
9. Can epistemic externalism help to solve the problem of induction?
10. Can the probability calculus solve the problem of induction?
11. “Why not say that methodological knowledge resides in knowing what to do with the cases, the examples, the problems that actually arise, rather than in a system of rules or general theory of rationality? For at this level, too, we can speak with Kuhn of ‘the priority of paradigms’ (exemplars): we agree more readily about cases than about candidate rules” (THOMAS NICKLES). Discuss.
12. Cause and effect are “conjoined but never connected” (DAVID HUME). Discuss.

END OF PAPER

28 May 2008 9.00 to 12.00

HISTORY AND PHILOSOPHY OF SCIENCE (5)

Science and Technology Studies

Before you begin read these instructions carefully:

*Answer **four** questions: answer **one** question chosen from **Section A** and **three** questions chosen from **Section B**.*

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Paper 5: Science and Technology Studies

SECTION A

1. “The main difference between a sociologist of STM (science, technology and medicine) and a bioethicist is that, in order to succeed in her research, the former must be committed to relativism, whereas the latter must be committed to anti-relativism.” Discuss.
2. “‘Science and Technology Studies’ is just another name for ‘History and Philosophy of Science’.” Discuss.
3. Is scientific knowledge political?

SECTION B

4. Can scientific experiments be replicated?
5. Is scientific knowledge intrinsically local?
6. “Numeracy is to mathematics as literacy is to literature.” Discuss.
7. How should we account for the similarities and differences between mathematical and numerate practices in ancient Mesopotamia and the Inka state?
8. Is the distinction between positive and negative genetic interventions morally relevant?
9. Which position provides the better framework for environmental ethics: deontology or consequentialism?
10. Compare the role of the distinction between theory and practice in the natural and in the social sciences.
11. What are the distinguishing characteristics of “popular science”?
12. Is “practice” a useful category in social-scientific investigations?

END OF PAPER

31 May 2008 9.00 to 12.00

HISTORY AND PHILOSOPHY OF SCIENCE (6)

History and Philosophy of Mind

Before you begin read these instructions carefully:

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Paper 6: History and Philosophy of Mind

SECTION A

1. If the mind is identical to the brain, could there nevertheless be distinctively “mental” in addition to “physical” disorders?
2. Are mental states accessible to objective investigation?
3. If the mind is a computer, what wrote the software and what reads it?

SECTION B

4. **Either** (a) What use, if any, is cognitive science to philosophy?
Or (b) Are tools that help one think literally part of one’s mind?
5. Do both anomalous monism and functionalism lead to the exclusion problem?
6. “‘You are in pain’ relates to ‘I am in pain’ as ‘It is five o’clock on the sun’ relates to ‘It is five o’clock in Cambridge’.” Discuss.
7. Is meaning normative?
8. “Propositions are units of semantic information, but not units like numbers rather units like dollars.” Discuss.
9. Why did Freud give sexuality such prominence in his theories?
10. “Psychoanalysis is both a pseudo-science and a pseudo-religion.” Discuss.
11. **Either** (a) How useful is the idea of governmentality in thinking about developments in psychological thinking after 1880?
Or (b) Are the concepts of nature and nurture equally implicated in the growth of twentieth-century British psychology?
12. **Either** (a) In conceptual and historical terms, what is the difference between psychopathology and psychiatry?
Or (b) What are the principal epistemological difficulties affecting the current clinical notion of hallucination?

END OF PAPER

NATURAL SCIENCES TRIPOS Part II

29 May 2008 9.00 to 12.00

HISTORY AND PHILOSOPHY OF SCIENCE (7)

Medicine from Antiquity to the Enlightenment

Before you begin read these instructions carefully:

*Students taking **History and Philosophy of Science** should answer **four** questions: answer **one** question chosen from **Section A** and **three** questions chosen from **Section B**.*

*Students taking **Biological and Biomedical Sciences** should answer **three** questions, all of them chosen from **Section B**. Do not answer any questions from **Section A**.*

Begin each answer on a separate sheet.

*Write legibly and on only **one** side of the paper.*

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Paper 7: Medicine from Antiquity to the Enlightenment

SECTION A

1. What was the role of “discovery” in early modern medicine?
2. What does a history of medicine that focuses solely on books miss out?
3. How was medicine taught before 1750?

SECTION B

4. What treatment options were available to the sick in ancient Mesopotamia?
5. Is it foolhardy to attempt to evaluate the efficacy of the therapies used in antiquity?
6. **Either** (a) How would you account for the continuing popularity of religious healing in Greco-Roman antiquity?
Or (b) What were the main resources available to ancient Greek and Roman healers to attract and keep clientele?
7. If you were a wounded soldier, would you prefer to be in an ancient Greek army or in the Roman army? Explain your choice.
8. **Either** (a) Why, according to early modern explanations for the causes of disease, were men and women equally susceptible to the plague?
Or (b) To what extent did clergymen and medical practitioners differ over the causes of pestilence?
9. Is Renaissance anatomy best characterised as “a triumph of observation over ancient texts”?
10. So far as communicating knowledge is concerned, does it make sense to think of England in the period between 1375 and 1640 as having one, unified medical culture or as a set of distinct medical cultures?
11. How was medicine sold in the pre-modern world and who bought it?
12. What defined the role of the “patient” in early modern Europe?

END OF PAPER

2 June 2008 9.00 to 12.00

HISTORY AND PHILOSOPHY OF SCIENCE (8)

Modern Medicine and Biomedical Sciences

Before you begin read these instructions carefully:

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Paper 8: Modern Medicine and Biomedical Sciences

SECTION A

1. How have patients exercised power over the practitioners of modern medicine?
2. What were the roles of visualisation and measuring technologies in the making of modern medicine?
3. What would a history of medicine from a woman's point of view look like?

SECTION B

4. "Are athletes healthy?" In what ways did doctors and physiologists answer this question over the last 150 years?
5. "Psychiatry is less a medical speciality than a restraining arm of the State, perennially required to address problems of social order rather than deliver medical cures." Does the history of psychiatry bear out this verdict?
6. **Either** (a) Are state medical services inevitably hospital-based?
Or (b) Why did the laboratory become part of the hospital?
7. Did anaesthetics and antiseptics bring about surgery's pre-eminent status, or were they only developed in consequence of that already-achieved status?
8. What was the programme of the "organic physicists", and what implications did it have for medicine?
9. How has the "mediatisation" of medicine affected the doctor-patient relationship over the last 50 years?
10. Was Social Medicine ever practiced in nineteenth-century Britain?
11. Is the distinction between a disease of the tropics and a tropical disease medical or political?
12. Why and in what ways did anatomy change around 1800?

END OF PAPER

2 June 2008 9.00 to 12.00

HISTORY AND PHILOSOPHY OF SCIENCE (9)

Images of the Sciences

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Paper 9: Images of the Sciences

SECTION A

1. How have historians of the sciences interacted with the sciences themselves?
2. How have philosophies of science interacted with science itself?
3. Why would anyone claim that science is a disinterested pursuit?

SECTION B

4. **Either** (a) “The example of Gaston Bachelard shows that any philosophy of science that also takes seriously the world of poetry will inevitably come to anti-realist conclusions.” Do you agree?

Or (b) “[T]ruth is not by nature free — nor error servile — its production is thoroughly imbued with relations of power” (MICHEL FOUCAULT). What implications does this view have for the sciences?
5. Is a historiography focused on human beings’ intentions and actions mere ideology?
6. Should a historian of science have a good knowledge of present-day science?
7. How can political considerations shape a conception of science? Discuss with respect to **either** Whewell and Mill, **or** nineteenth-century German scientific materialism.
8. What was logical positivism?
9. How does Berkeley’s account of natural science differ from Locke’s?
10. Did Kant dispel Hume’s scepticism concerning the idea of cause and effect?
11. In what sense, if any, is Nature purposive for Kant?
12. Are “Big Pictures” of the history of science possible now that triumphal tales of scientific progress have gone out of fashion?

END OF PAPER