

NATURAL SCIENCES TRIPOS Part II
HISTORY AND PHILOSOPHY OF SCIENCE

Paper 1: Classical Traditions in the Sciences

Specimen paper for 2012

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

SECTION A

1. What makes a 'classical tradition' in the sciences?
2. To what extent was the history of the sciences in the pre-modern period linked to the spread of literacy?
3. How important was the creation of new knowledge to scholars and natural philosophers in the periods before 1600 AD?

SECTION B

4. Anaximander (6th century CE) has been credited with having produced 'the first specimen of a new genre, the treatise *Peri Physeōs*, "On the Nature of Things". Discuss the significance of this new genre.
5. Is there any neutral way to evaluate the strengths and weaknesses of the cosmologies in Aristotle's *On the Heavens* and in *Huainanzi*?
6. 'Astronomy can be understood to be the oldest of the sciences, because of its reliance on instruments.' Discuss.
7. 'Arabic science had become autonomous by the eleventh century CE.' Discuss.
8. 'Arabic science is a conduit through which Greek scientific ideas became known to Latin Europe.' Evaluate this statement.
9. How and why were classical traditions useful to Renaissance natural philosophers?
10. How should we write the history of natural philosophy?
11. Why did it take so long for the toxic properties of mercury to be taken seriously?

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Paper 2: Early Medicine

Specimen paper for 2012

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

SECTION A

1. How were women from antiquity to the Enlightenment involved in treating the ill and assisting childbirth?
2. To what extent were patients before 1750 involved in the diagnosis and treatment of their illness?
3. How does the history of medicine draw upon sources besides texts in manuscripts and books?

SECTION B

4. In what ways did state intervention influence the course of medical history in Graeco-Roman antiquity?
5. What developments were there in medicine in Late Antiquity, and why were they significant?
6. How important was competition in shaping the medical profession in the Greek and Roman worlds?
7. Were medieval responses to the Black Death grounded more in fear of God than belief in doctors?
8. 'The learned medicine of the schools had little to do with how medicine was practised in medieval Europe.' Discuss.
9. What was the role of religion in medieval and early modern views of the body, of illness and of healing?
10. Did new diseases and anatomical discoveries between 1450 and 1700 change medical theories and treatments?
11. To what extent did printing influence medical education, communication and practice before 1750?

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Paper 3: Natural Philosophies: Renaissance to Enlightenment

Specimen paper for 2012

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

SECTION A

1. What, if anything, was new about the organization of knowledge production in early modern Europe?
2. What was the role of printed books in the production of early modern natural knowledge?
3. How, if at all, did travel change European notions of nature and culture between 1600 and 1800?

SECTION B

4. How significant were communication networks to early modern natural philosophy?
5. Did alchemists do experiments?
6. In what ways were eighteenth-century natural history and natural philosophy economic practices?
7. Compare and contrast the significance of *Principia mathematica* and of *Opticks* in Isaac Newton's natural philosophy.
8. 'The use of instruments as demonstration apparatus in the eighteenth century was as much about curiosity, wonder and spectacle as about gaining new knowledge.' Do you agree?
9. Were collections indispensable for early modern naturalists?
10. Why was the generation of living beings so controversial an investigative problem in the eighteenth century?
11. Did science and magic become incompatible in early modern Europe?

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Paper 4: Science, Industry and Empire

Specimen paper for 2012

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

SECTION A

1. 'The history of nineteenth-century science is a history of learned societies and laboratories.' Discuss.
2. 'There can be no general history of nineteenth-century science, but only particular histories of the sciences of various nations.' Discuss.
3. 'Historians of nineteenth-century science, for all their gestures to social history, continue to focus on a handful of individuals, usually men.' Is this the case? If so, does it matter?

SECTION B

4. Compare and contrast the institutionalisation of experimental physiology and anthropology in nineteenth-century Germany.
5. What role did scientific maps and mapping have as tools of empire in the nineteenth century?
6. Why might the historical idea of a 'Darwinian Revolution' in nineteenth-century life science be both mythological and misleading?
7. To what extent did developments in the nineteenth-century physical sciences depend on new scientific instruments?
8. 'No subject has lately excited more curiosity and general interest among geologists and the public than the question of the Antiquity of the Human Race' (Charles Lyell, 1863). What role did the public play in nineteenth-century debates over human evolution?
9. To what extent did nineteenth-century observatories and laboratories come to resemble factories?
10. Is 'Humboldtian science' a useful concept for historians?
11. Are 'colonial science' and 'imperial science' necessarily the same thing?

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Paper 5: Modern Medicine and Biomedical Sciences

Specimen paper for 2012

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

SECTION A

1. 'Medical technologies have not shaped society. Rather, society has shaped medical technologies.' Assess for the nineteenth and twentieth centuries.
2. 'Modern medicine is based on knowledge gained by experiment, and this is the secret of its success.' Discuss.
3. 'Big promises and bigger disappointments.' Is that a fair summary of the history of science in medicine since 1789?

SECTION B

4. 'Read little, see much, do much', physicians and surgeons told their students in post-revolutionary Paris. To what extent did their successors follow this advice?
5. According to Victorian public health reformers, did poverty cause disease, or disease cause poverty? Why did they argue as they did?
6. 'There were two great revolutions in surgical practice during the nineteenth century.' Were there really?
7. How and why did English 'ague' become tropical 'malaria'?
8. 'An ongoing trend towards medicalization.' Is this a useful summary of the history of pregnancy and childbirth since 1750?
9. How did the making of penicillin as an effective antibiotic differ from the earlier introduction of insulin as a therapy for diabetes?
10. 'The medical establishment has become a major threat to health' (Ivan Illich, 1976). What was 'the medical establishment' and why did Illich and others criticize it so fiercely?
11. 'Psychiatry may aspire to be an ordinary medical specialty but can never be because it has been from its inception, and continues to be, determined by the narrow constraints of the law, by the vagaries of State power and by the desire of the psychiatrist to exert moral mastery over the patient.' Assess this claim.

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Paper 6: Metaphysics, Epistemology and the Sciences

Specimen paper for 2012

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

SECTION A

1. Does the Humean project succeed in building the foundations of science while eschewing the metaphysics of causation, powers and necessity?
2. In what sense, if any, is science unified?
3. Should we take metaphysical lessons from science?

SECTION B

4. Why might ontological reduction not lead to epistemological reduction?
5. Are laws of nature mere generalisations? If so, can they explain anything?
6. Does Laudan offer a more convincing account of scientific progress than Kuhn?
7. Can scientific discovery be a rational process?
8. How are idealisations in science justified?
9. Can a Darwinian be an essentialist about species?
10. What, if anything, is wrong with typological thinking in biology?
11. Do scientific models function like metaphors?

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Paper 7: Ethics and Politics of Science, Technology and Medicine

Specimen paper for 2012

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

SECTION A

1. Is the 'value-free ideal' sustainable for any science?
2. Is there an ethically relevant distinction between science and its uses?
3. Does the identity of researchers affect scientific research? Should it?

SECTION B

4. How do the courts distinguish between 'junk' and 'sound' science?
5. Who won the two cultures debate?
6. Should social values be used to close the inductive gap?
7. Is informed consent necessary for medical research to be ethical?
8. Can happiness be objectively measured?
9. How and why have gender categories been challenged in psychiatry?
10. On what grounds should the State decide whether or not to fund research into genetic engineering?
11. Must policy-making be 'evidence-based'?

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Paper 8: History and Philosophy of the Physical Sciences

Specimen paper for 2012

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

SECTION A

1. Has the historical development of physics provided a pattern for all other sciences? Should it?
2. Has science given an increasingly true or accurate knowledge of the physical universe? How so?
3. Discuss various ways in which political or economic factors have facilitated or hindered the development of science.

SECTION B

4. To what extent did programmes for the unification of science in the 19th century rely on reductionism?
5. What were the purposes of experimentation in pre-20th century physical sciences?
6. How and why do physicists replicate experiments?
7. Describe ways in which observation in the physical sciences have gone beyond 'table-top' experiments.
8. Does physics have the capability to tell us about the nature of space and time? Discuss with reference of historical developments.
9. How is astronomy different from physics?
10. Were scientists justified in rejecting the phlogiston theory at the time of the Chemical Revolution? Compare with the case of the ether or continental drift (or both).
11. In your view, what is the best solution to the quantum measurement problem? Why?

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Paper 9: History of Philosophy of Science

Specimen paper for 2012

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

SECTION A

1. How have theories of knowledge and of science responded to developments in the sciences?
2. Are there timeless questions in the philosophy of science?
3. 'For the last 300 years the problem of the a priori has been a basic issue in the philosophy of knowledge.' Discuss.

SECTION B

4. Is Berkeley's instrumentalist view of science defensible?
5. Does the rejection of corpuscularianism necessitate the rejection of Locke's primary/secondary quality distinction?
6. Did Hume believe in the existence of external objects?
7. Did Kant answer Hume on causation?
8. Is Kant's account of space defeated by the discovery of non-Euclidean geometries?
9. 'There will never be a Newton of the glass blade' (Immanuel Kant). Discuss.
10. Is scientific theorizing aimed at the discovery of truths about the world? Discuss in relation to the philosophies of science of Ernst Mach and Pierre Duhem.
11. What was logical positivism?

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Paper 10: History and Philosophy of Social and Psychological Sciences

Specimen paper for 2012

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

SECTION A

1. Are the human sciences fundamentally different from the natural sciences?
2. Is interpretation necessarily subjective?
3. 'The human sciences have always been social movements as well as theoretical projects.' Is this historically true?

SECTION B

4. Could a machine have thoughts and feelings?
5. Does psychophysical interaction tell us anything about the nature of mental events and processes?
6. When did sex begin?
7. Does economics operate with an adequate picture of rationality? Does it matter?
8. 'The essential vocation of interpretive anthropology is not to answer our deepest questions, but to make available to us answers that others, guarding other sheep in other valleys, have given, and thus to include them in the consultable record of what man has said' (Geertz, *Interpretation of Cultures*). Discuss.
9. Are there laws in the social sciences?
10. 'The interpretation of the dreams is the royal road to the unconscious' (Freud). Why did he think this?
11. 'Psychoanalysis used to be a science, but now it is just a therapy.' Discuss.