NATURAL SCIENCES TRIPOS Part II
CLASSICAL TRIPOS Part II

Friday 1 June 2012 9.00 to 12.00 Examination Halls, New Museums Site

HISTORY AND PHILOSOPHY OF SCIENCE (1)

Classical Traditions in the Sciences

Before you begin read these instructions carefully:

*Students taking **History and Philosophy of Science** or **Classics** should answer **four** questions: answer **one** question chosen from **Section A** and **three** questions chosen from **Section B**. All questions carry equal weighting.*

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. What role has translation played in the formation of the ‘classical traditions’ in the sciences?

2. When did classical traditions end in the sciences, and why?

3. What was the relationship between religion and science before 1600?

SECTION B

4. How have those engaged in scientific work in the modern period regarded classical traditions of science?

5. ‘Content dictates form’. How far does this apply to ancient Greek and Roman writings on nature?

6. How did ancient Greek and Roman writers explain ‘ta meteora’ (what Plato called ‘lofty things’)?

7. To what extent did Arabic sciences rely on a knowledge of Greek sciences?

8. Why might someone own an astrolabe in Europe before AD 1600?

9. Assess the significance of Renaissance attitudes towards nature for the classical traditions.

10. How and why have social attitudes to the use of mercury changed since the 1960s?

11. What is at issue in the debate between historians about the identity of natural philosophy? Where do you think the truth lies?

END OF PAPER

NATURAL SCIENCES TRIPOS Part II

Thursday 31 May 2012 | 9.00 to 12.00 | Senate House

HISTORY AND PHILOSOPHY OF SCIENCE (2)

Early Medicine

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**. All questions carry equal weighting.*

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**.*

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Paper 2: Early Medicine

SECTION A

1. Discuss the influence of religious beliefs on views of health and medical practice in pre-modern Europe.

2. How did medical practitioners before 1750 acquire skills, knowledge and clients?

3. Galen's methods and views of the body dominated medicine and anatomy from antiquity to the end of the early modern period. How did Galenism change and how did it remain the same?

SECTION B

4. How did the professional identity of physicians change between the times of Hippocrates and Galen?

5. In what ways did physicians benefit from developing close links with the ruling classes in the Greek and Roman worlds?

6. What responses did dissection provoke in Greek and Roman medicine?

7. Was medieval medicine concerned with theory at the expense of practice?

8. What factors affected patient choice of medical practitioner in the Middle Ages?

9. Discuss continuities and changes in medieval and early modern responses to the plague.

10. Assess the impact of technological innovations and discoveries on medicine between 1450 and 1750.

11. In early modern Europe, to what extent did the profession of midwives change?

END OF PAPER

NATURAL SCIENCES TRIPOS Part II

Friday 1 June 2012 1.30 to 4.30 Examination Halls, New Museums Site

HISTORY AND PHILOSOPHY OF SCIENCE (3)

Natural Philosophies: Renaissance to Enlightenment

Before you begin read these instructions carefully:

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

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Paper 3: Natural Philosophies: Renaissance to Enlightenment

SECTION A

1. Why was God important in early modern natural philosophy?

2. To what extent were early modern natural philosophy and natural history disciplines?

3. Which was more important in the study of nature between 1600 and 1800: book learning or personal observation?

SECTION B

4. How did early modern people explain physical effects in terms of celestial influences?

5. Were early modern laboratories private or public spaces?

6. How were occult qualities used to correct or to perfect nature? Discuss in relation to alchemy, or to healing, or to both.

7. What were the effects of overseas travel on Linnaean natural history and on Newtonian natural philosophy?

8. How did iron and steel manufacture affect the eighteenth-century British economy?

9. How did collectors' practices and the materials they collected change during the eighteenth century?

10. What impact did the development of optical instruments have on knowledge of nature between 1600 and 1800?

11. How and why did divergent zoological classifications emerge at the Muséum d'Histoire Naturelle around 1800?

END OF PAPER

NATURAL SCIENCES TRIPOS Part II

Monday 4 June 2012 1.30 to 4.30 Examination Halls, New Museums Site

HISTORY AND PHILOSOPHY OF SCIENCE (4)

Science, Industry and Empire

Before you begin read these instructions carefully:

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

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Paper 4: Science, Industry and Empire

SECTION A

1. Describe some of the spaces in which nineteenth-century scientific practitioners interacted with the public. How were the sciences affected by these encounters?

2. To what extent were the sciences allied to ideas of progress in the nineteenth century?

3. Why was so much nineteenth-century scientific activity devoted to classifying, naming, and the establishment of standards?

SECTION B

4. Compare and contrast French, British and German attitudes towards evolutionary ideas in the second half of the nineteenth century.

5. Blacksmiths' arms, pigeons and primroses, cheese mites, trees, and the entangled bank: how and why were familiar analogies employed in nineteenth-century evolutionary writings?

6. 'Am I not a man and a brother?' Discuss in relation to nineteenth-century debates about race and empire.

7. Compare and contrast the place of science in the informal empire of free trade with that of the 'new imperialism' of direct colonial control.

8. Why did German support for scientific research increase during the nineteenth century?

9. What difference did the teaching of students in laboratories make to the development of nineteenth-century sciences?

10. The term 'scientist' was coined in 1833, but it did not become widely used in Britain until the end of the nineteenth century. Why?

11. How can the study of mapping practices contribute to our understanding of imperial rule?

END OF PAPER

NATURAL SCIENCES TRIPOS Part II

Wednesday 30 May 2012 9.00 to 12.00 Wesley Church, King Street

HISTORY AND PHILOSOPHY OF SCIENCE (5)

Modern Medicine and Biomedical Sciences

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**. All questions carry equal weighting.*

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**.*

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Paper 5: Modern Medicine and Biomedical Sciences

SECTION A

1. '"Medical science", like "military intelligence", is a contradiction in terms.' Does your understanding of the history of science and medicine since 1750 support such a cynical view?

2. 'Surveillance Medicine requires the dissolution of the distinct clinical categories of healthy and ill as it attempts to bring everyone within its network of visibility.' (Armstrong, 1995) Discuss.

3. The 'health of the nation' has economic and military significance; evaluate the impact of EITHER military OR industrial demands on the development of modern medicine.

SECTION B

4. On what pre-existing resources did the founders of the post-revolutionary Parisian Clinical School draw, and how novel were the uses to which these were put in the early nineteenth century?

5. How did the supporters of the germ theory of disease convince medical practitioners and the public that bacteria caused disease?

6. In what ways did anaesthesia transform surgery and midwifery?

7. 'Some see visual images as so weak that they need words to explain them. Others see visual images as so strong that they may need words to control them.' Discuss with reference to X-rays and their introduction into clinical medicine.

8. The middle of the twentieth century is often called the Golden Age of medicine; how did the 'Golden Age' come about and why did it end?

9. 'Technical marvels have rendered the once opaque womb transparent, stripping the veil of mystery from the dark inner sanctum.' (Harrison, 1990) Discuss in relation to postwar medicine and politics.

10. Why did the lunatic asylums close?

11. Why did Patrick Manson argue that developing research in tropical medicine would be economically and politically beneficial to British colonial rule? To what extent was tropical medicine indeed a tool of empire?

END OF PAPER

NATURAL SCIENCES TRIPOS Part II

Thursday 31 May 2012 | 9.00 to 12.00 | Senate House

HISTORY AND PHILOSOPHY OF SCIENCE (6)

Metaphysics, Epistemology and the Sciences

Before you begin read these instructions carefully:

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Paper 6: Metaphysics, Epistemology and the Sciences

SECTION A

1. ‘The sciences have a variety of subject matters, but a unified set of methods.’ Discuss.

2. What is the most significant challenge for scientific realism? Can it be met?

3. Do the sciences carve nature at the joints?

SECTION B

4. Assess Laudan’s account of scientific progress.

5. Is it the case that rationality governs the process of theory-choice but not the process of discovery?

6. ‘To explain a phenomenon is to deduce it from a statement of law and the relevant initial conditions.’ Discuss.

7. Is there a single correct theory of probability?

8. Can all the content of science be expressed in explicit statements?

9. No model is a true replica of reality. Does that mean that idealisation is always justified?

10. Is essentialism in biology dead? Should it be?

11. Are there biological laws?

END OF PAPER

NATURAL SCIENCES TRIPOS Part II

Monday 4 June 2012	9.00 to 12.00	Senate House

HISTORY AND PHILOSOPHY OF SCIENCE (7)

Ethics and Politics of Science, Technology and Medicine

Before you begin read these instructions carefully:

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

SECTION A

1. Can the sciences be ‘value-free’? Should they be?

2. When and why should we listen to scientists?

3. Should science be more democratic?

SECTION B

4. Compare the confrontation of Arnold and Huxley with that of Snow and Leavis over the cultural roles of science and literature.

5. How should we decide which topics scientists should not be allowed to research?

6. Given the differing goals of law and science, what is the role of the expert witness in court?

7. What should be the role of well-being in social policy?

8. Is human genetic testing eugenics in disguise?

9. Eligibility tests for women’s sports have been called ‘sex tests’, ‘gender tests’ and ‘femininity tests’. Which of these is the most appropriate term?

10. Should scientific biographies approach the lives of men and women differently?

11. Can scientific advice ever decisively resolve practical debate? Discuss with reference to at least one legal, moral or political example.

END OF PAPER

NATURAL SCIENCES TRIPOS Part II

Saturday 2 June 2012 9.00 to 12.00 Examination Halls, New Museums Site

HISTORY AND PHILOSOPHY OF SCIENCE (8)

History and Philosophy of the Physical Sciences

Before you begin read these instructions carefully:

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Paper 8: History and Philosophy of the Physical Sciences

SECTION A

1. How has the character of knowledge in the physical sciences been shaped by institutional and political settings?

2. Does the development of the physical sciences since the eighteenth century exhibit an overall tendency towards unity and reductionism?

3. How encouraged should scientific realists be by what they learn in the history of the various physical sciences?

SECTION B

4. How have changes in the boundaries between physics and astronomy affected the development of these sciences from the early modern period onward?

5. What are the tacit elements which enter into the practice of physics?

6. What were the purposes of experimentation in pre-twentieth-century physical sciences?

7. ‘Instruments in science are like spectacles: they are just devices for extending our sight or other senses.’ Discuss, in relation to at least two examples in the physical sciences.

8. What were the most important aspects of the twentieth-century transformation of experimental physics from the ‘table-top’ mode to the ‘Big Science’ mode?

9. Were chemists justified in rejecting the phlogiston theory at the time of the Chemical Revolution?

10. What exactly changed from being absolute to relative in the transition from Newtonian physics to special relativity?

11. ‘A solution to the quantum measurement problem requires admitting subjectivity into physics.’ Discuss in relation to at least two of the following three proposed solutions: the Copenhagen interpretation, the pilot-wave interpretation, and the Everett interpretation.

END OF PAPER

NATURAL SCIENCES TRIPOS Part II

Friday 1 June 2012 1.30 to 4.30 Examination Halls, New Museums Site

HISTORY AND PHILOSOPHY OF SCIENCE (9)

History of Philosophy of Science

Before you begin read these instructions carefully:

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Paper 9: History of Philosophy of Science

SECTION A

1. Was logical empiricism more Kantian or more Humean?

2. Why has the concept of causation been so problematic in philosophy of science?

3. Discuss, with examples, ways in which developments in the sciences have affected the philosophy of science.

SECTION B

4. Can one consistently agree with Berkeley's immaterialism and disagree with his theism?

5. What is Locke's best argument against thinking that sortal terms stand for real essences?

6. In what sense, if any, was Hume a sceptic?

7. What is 'experience' according to Kant?

8. 'Geometry is a science which determines the properties of space synthetically, and yet a priori.' (*Critique of Pure Reason*, A25/B40) Discuss.

9. What difficulties, if any, do organisms raise for Kant's account of nature?

10. Compare the positivism of Auguste Comte with that of the Vienna Circle.

11. Compare the ways in which Ernst Mach and Pierre Duhem sought to oust metaphysics from the sciences.

END OF PAPER

NATURAL SCIENCES TRIPOS Part II

Thursday 31 May 2012 1.30 to 4.30 Examination Halls, New Museums Site

HISTORY AND PHILOSOPHY OF SCIENCE (10)

History and Philosophy of Social and Psychological Sciences

Before you begin read these instructions carefully:

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Paper 10: History and Philosophy of Social and Psychological Sciences

SECTION A

1. Is interpretation subjective, objective or neither?

2. What has been the role of ideology in the development of the human sciences?

3. Different human sciences operate with different visions of individuals. Are they incompatible?

SECTION B

4. ‘The existence of psychophysical interaction supports a materialist view of the mind.’ Discuss.

5. ‘Any inquiry into the sexual lives of subjects under observation is incompatible with scientific objectivity’ (Georges Bataille on the Kinsey Report, from *Eroticism*). Discuss.

6. To be understood, social action requires interpretation. Does that make social sciences fundamentally different from natural sciences?

7. Are humans utility maximisers? If not, does it matter?

8. ‘Sex has become the truth of our being’ (Michel Foucault, *History of Sexuality Volume 1*). Discuss.

9. ‘If social science is to be truly scientific, it needs to discover laws.’ Discuss.

10. ‘Psychology, too, is a natural science. What else can it be? But its case is different. Not everyone is bold enough to make judgements about physical matters; but everyone – the philosopher and the man in the street alike – has his opinion on psychological questions and behaves as if he were at least an amateur psychologist.’ (Freud, 1938) What implications does this argument have for psychoanalysis as part of psychology?

11. Is it more profitable to view religion through the lens of psychoanalysis, or to view psychoanalysis as itself a religion?

END OF PAPER