

NATURAL SCIENCES TRIPOS Part II
CLASSICAL TRIPOS Part II

Friday 30 May 2003

9 to 12

HISTORY AND PHILOSOPHY OF SCIENCE (1)

Classical Traditions in the Sciences

Before you begin read these instructions carefully:

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

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SECTION A

- 1 How did pre-1600 natural philosophers and mathematicians use the histories of their disciplines?
- 2 'The Scientific Revolution outshines everything since the rise of Christianity and reduces the Renaissance and Reformation to the rank of mere episodes' (HERBERT BUTTERFIELD). Discuss.
- 3 'The most important person in the history of science before 1600 was undoubtedly Aristotle'. Do you agree?

SECTION B

- 4 'Ancient Greek science developed in a spirit of competitive display'. Discuss.
- 5 'The concept of "nature" was not discovered: it had to be invented'. Discuss in relation to one or more of Greece, China, Mesopotamia.
- 6 **Either** (a) How did Avicenna (Ibn Sina) overcome the differences between Galen and Aristotle in his biology?
Or (b) Why did the Muslims write geographical works?
- 7 **Either** (a) How did the commercial and territorial expansion of early-modern Europe affect attitudes towards nature?
Or (b) How did the social standing of mathematicians change in the early-modern period?
- 8 How did people learn about the ideas and practices of alchemy before 1600?
- 9 **Either** (a) Discuss the relative importance of books, instruments, and letters for the practice of astronomy in the sixteenth century.
Or (b) How important was the distinction between 'proof' and 'persuasion' to early-modern natural philosophers?

END OF PAPER

Saturday 31 May 2003 1.30 to 4.30

HISTORY AND PHILOSOPHY OF SCIENCE (2)

Natural and Moral Philosophies

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SECTION A

- 1 Discuss the effects of political change on the study of nature with reference to a European country of your choice during the seventeenth or eighteenth centuries.
- 2 ‘During the Middle Ages, it was indispensable that a scientific text should be attributed to an author, since this was an index of truthfulness. A proposition was considered as drawing even its scientific value from its author. Since the seventeenth century, this function has steadily been eroded in scientific discourse. It now functions only to give a name to a theorem, an effect or a syndrome’ (MICHEL FOUCAULT). Do you agree?
- 3 ‘Learning presently runs forwards with such an amazing Rapidity, that the Modern Improvements therein, have infinitely outdone all the Attainments of the Sons of Men in that Kind before them put together’ (JOHN CLARKE, *An Essay upon Study*, 1731). Discuss.

SECTION B

- 4 **Either** (a) ‘Neither the naked hand nor the understanding left to itself can effect much. It is by instruments and helps that the work is done, which are as much wanted for the understanding as for the hand. And as the instruments of the hand either give motion or guide it, so the instruments of the mind supply either suggestions for the understanding or cautions’ (FRANCIS BACON, *Novum Organum*, 1620). Discuss.
- Or** (b) What was the appeal of Cartesianism to seventeenth-century natural philosophers?
- 5 Compare early-modern Europeans’ practical applications of astrology and astronomy.
- 6 **Either** (a) How were ways of seeing altered by the development of microscopes and telescopes?
- Or** (b) What kinds of evidence were used to support theories of the structure of the earth and heavens in the seventeenth century?
- 7 **Either** (a) Why did some seventeenth-century natural philosophers claim that it was an intellectual virtue to eschew hypotheses?
- Or** (b) ‘The transcendental idealist is therefore an empirical realist’ (IMMANUEL KANT). Discuss.
- 8 **Either** (a) To what extent were eighteenth-century sciences commercial enterprises?
- Or** (b) ‘Wonders and the Order of Nature’: Is this an apt description of eighteenth-century natural history?
- Or** (c) What were the Linnean reforms of botany and why did they succeed?
- 9 **Either** (a) What are external objects, according to Berkeley?
- Or** (b) Is Hume a sceptic with regard to the senses? Why?

END OF PAPER

HISTORY AND PHILOSOPHY OF SCIENCE (3)

Science, Industry and Empire

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SECTION A

- 1 'Science is nothing but trained and organized common sense' (T.H. HUXLEY, 1880). Is this a good description of nineteenth-century science?
- 2 Why did European governments invest resources in science during the nineteenth century?
- 3 How and why did the laboratory come to dominate the physical and biological sciences?

SECTION B

- 4 **Either** (a) Was Victorian energy physics an industrial science?
Or (b) Why was electromagnetic field theory first developed in Britain?
- 5 **Either** (a) If *Vestiges of the Natural History of Creation* largely failed to convince practising naturalists that species had evolved, was it of any significance?
Or (b) 'The English have a peculiar love of regarding Nature from a theological point of view' (CHRISTIAN SCHÖNBEIN). Discuss with respect to the first half of the nineteenth century.
- 6 **Either** (a) Is Humboldtian science another name for imperial science?
Or (b) How different were the relations of the exact sciences and the descriptive sciences to cultural imperialism?
- 7 **Either** (a) How did technological innovations improve visual representations of scientific phenomena in the modern period?
Or (b) Why were historic scientific instruments collected and displayed in Victorian Britain?
- 8 **Either** (a) How and why did natural historians come to be derided as 'amateurs'?
Or (b) 'The [evolutionary] synthesis is remarkably similar to Darwin's original theory of 1859. It was not so much the discovery of new facts that characterized the synthesis as the removal of misunderstandings' (ERNST MAYR). Do you agree?
- 9 **Either** (a) 'The labour for inward satisfaction, not for external success, has at all times peculiarly distinguished the scientific men of Germany' (HERMANN VON HELMHOLTZ, 1869). Why did Helmholtz and his associates insist on the purity of the sciences?
Or (b) What was the attitude of the German National Socialist state towards science and technology?

END OF PAPER

Thursday 29 May 2003 1.30 to 4.30

HISTORY AND PHILOSOPHY OF SCIENCE (4)

Metaphysics, Epistemology and the Sciences

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SECTION A

- 1 'Whatever the scientific speciality, the roles of evidence and the structure of explanation are fundamentally the same.' Discuss.
- 2 In what sense, and on what basis, can philosophers of science say how science *ought* to proceed?
- 3 'The natural sciences should be a model for every epistemic endeavour.' Discuss.

SECTION B

- 4 Compare the views of Whewell and Mill on induction.
- 5 **Either** (a) Does Kuhn's account of exemplars imply that all reasoning is from instance to instance, without any substantive aid from rules?
Or (b) 'General principles are used as shorthand for the instances they cover'. Discuss with reference to a specific discipline (for example, the law).
- 6 **Either** (a) What is the difference between saying that if C had not occurred, E would not have occurred either, and saying that C caused E?
Or (b) What is the relationship between laws and correlations?
- 7 'Any causal model of explanation is refuted twice over, since there are explanations that are not causes and causes that do not explain.' Discuss.
- 8 **Either** (a) 'The forming of testimonial beliefs typically is—and should be—based on inferences. In this regard, the forming of testimonial beliefs differs from the forming of perceptual beliefs' (ELIZABETH FRICKER). Discuss.
Or (b) Is it possible to provide a global justification for our trust in testimony?
- 9 **Either** (a) Are genes the only true units of selection?
Or (b) Is the debate over adaptationism one to be settled by experiment?

END OF PAPER

Wednesday 28 May 2003 9 to 12

HISTORY AND PHILOSOPHY OF SCIENCE (5)

Science and Technology Studies

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SECTION A

- 1 How does the sociology of science help in studying the role of race and gender in science?
- 2 How is sociology relevant to the study of the history of science?
- 3 Are the sciences value free?

SECTION B

- 4 **Either** (a) To what extent can the informed consent of those who will be affected justify health care decisions and/or policies?
Or (b) What restrictions, if any, should there be on procreative autonomy? Illustrate your answer with reference to at least one reproductive technology.
- 5 **Either** (a) 'Science has no place for the defeated except as objects of experiment' (SHIV VISWANATHAN). Discuss the claim that certain scientific practices embody racial bias.
Or (b) How did the relations between scientists and governments change after World War II?
- 6 What, if anything, is wrong with histories of scientific progress?
- 7 **Either** (a) Do scientists ever replicate experiments?
Or (b) 'The problem with interest explanations in the history of science is that they reduce scientists to being puppets of social and political movements.' Discuss.
- 8 **Either** (a) Should the term 'popular science' be used in science studies?
Or (b) 'The interests of journalists and scientists converge to skew media coverage towards an image of science that ignores the complexities of the research process.' Discuss.
- 9 Can or should a feminist be objective?

END OF PAPER

Wednesday 28 May 2003 1.30 to 4.30

HISTORY AND PHILOSOPHY OF SCIENCE (6)

History and Philosophy of Mind

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SECTION A

- 1 How relevant is the philosophical study of language and thought to the empirical investigation of mind and behaviour?
- 2 'The apparent fact that the scientist has direct, permanent and involuntary access to a mind has been taken to mean that the scientific study of the mind will necessarily be different from that of the physical reality.' Discuss.
- 3 How have the technologies associated with the sciences of the mind affected the development of theories about the mind?

SECTION B

4 **Either** (a) 'Psychoanalysis is not so much a question of science as a matter of taste, Dr. Freud being an artist who lives in the fairyland of dreams among the ogres of perverted sex' (JAMES MCKEEN CATTELL, *Science*, 1926). How accurate is this verdict?

Or (b) 'Psychoanalysis could have been a part of scientific medicine, with testable theories and a social organisation like other professional interest groups. Instead it became hostile to the values of objectivity and repeatability, a closed guild of masters and apprentices seeking solely to preserve their rituals and their undeserved reputation for privileged access to the ineffable.' Is this true?

5 'Over himself, over his own body and mind, the individual is sovereign' (JOHN STUART MILL). If this is correct, does it mean that we can never justify treating the mentally unwell against their will?

6 Can we explain the main flaws in the current concept of hallucination in terms of its history?

7 Compare Freud's theory of the unconscious with one or more rival accounts.

8 **Either** (a) Discuss the impact of quantification on the development of British psychology in the nineteenth century.

Or (b) 'War provided "a laboratory" for sciences of the psyche in twentieth-century Britain'. Discuss.

9 **Either** (a) Consider the ways in which various discourses of the self, including its gender, mediate various representations of psychotropic drugs.

Or (b) 'The muscle and money of the pharmaceutical industry are behind the escalating use of psychotropic drugs for lifestyle ailments'. Discuss.

END OF PAPER

Saturday 31 May 2003

9 to 12

HISTORY AND PHILOSOPHY OF SCIENCE (7)
HISTORY OF MEDICINE (1)

History of Medicine from Antiquity to the Enlightenment

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SECTION A

- 1 How were claims to medical knowledge used to legitimate measures of social control before 1750?
- 2 'From Antiquity through the Enlightenment disease remained constant and medicine changed'. Discuss.
- 3 'The disparities in the status and privileges of men and women are nowhere more apparent than in health care.' Discuss in relation to the history of medicine before 1750.

SECTION B

- 4 **Either** (a) How different were naturalistic and supernaturalistic traditions of medicine in Greco-Roman Antiquity?
Or (b) Why was dissection so controversial among the Greeks and Romans?
- 5 **Either** (a) To what extent did university medical faculties in northern and southern Europe develop differently?
Or (b) Is it appropriate to view the medieval hospital as a 'total therapeutic environment'?
- 6 **Either** (a) 'A young man taken very violently with griping in the Guts, and having continued so for a considerable time, his friends applying themselves to me, I sent him a quarter of a pint of *Stella* to be heated and drank oft by, and it perfectly cured him' (WILLIAM WALWYN, *Physic for Families*, 1669). What does this passage illustrate about healing in early-modern England?
Or (b) How did medical and legal expertise conflict over the body?
- 7 **Either** (a) How important was diet in medieval medicine?
Or (b) What were the differences between the healing powers of amulets and relics in medieval and/or early-modern Europe?
- 8 **Either** (a) How and why was childbirth 'medicalised' in seventeenth-century Europe?
Or (b) When and why would someone consult a surgeon in medieval and/or early-modern Europe?
- 9 Was there an anatomical 'renaissance' in early-modern Europe?

END OF PAPER

NATURAL SCIENCES TRIPOS Part II
MEDICAL AND VETERINARY SCIENCE TRIPOS Part II

Thursday 29 May 2003

9 to 12

HISTORY AND PHILOSOPHY OF SCIENCE (8)
HISTORY OF MEDICINE (2)

Modern Medicine and Biomedical Sciences

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SECTION A

- 1 Has medicine been the 'greatest benefit to mankind'? Discuss.
- 2 'Cures for diseases are constructed, not discovered'. Are they?
- 3 Is the history of modern medicine predominantly composed of stories about maintaining health or about curing diseases?

SECTION B

- 4 The laboratory has become an 'obligatory passage point' for medicine. Do you agree?
- 5 What were the legacies of World War II's medical mobilisation?
- 6 **Either** (a) 'In the nineteenth century, the scientific authority of medicine rested on the microscope'. Did it?
Or (b) 'Madness does not conform to the medical model of disease and never has done'. So the history of psychiatry is very different from the history of medicine in general'. Discuss.
- 7 What is colonial about 'colonial medicine'?
- 8 'The rise of modern medicine is the rise of the hospital'. Is it?
- 9 What do these two images reveal about the changes in anatomy and physiology between the 1630s and the 1830s? (**See next page.**)

END OF PAPER



Rembrandt's Anatomy of Dr Tulp (1632)



Mouchy (1832)