

Friday 2 June 2000 9 to 12

HISTORY AND PHILOSOPHY OF SCIENCE (1)

Classical Traditions in the Sciences

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

SECTION A

- 1 Compare and contrast the chief motivations of those engaged in natural philosophy in c. 200 CE and in c. 1600.
- 2 How natural, and how philosophical, was natural philosophy before 1650?
- 3 Discuss the use of authorities in the scientific discourse of the pre-modern era.

SECTION B

- 4 **EITHER** Compare and contrast Plato's and Aristotle's natural teleology.
OR Evaluate the matches or mismatches between Aristotle's practice of zoological investigation and his recommendations in the Posterior Analytics.
- 5 **EITHER** Discuss the use of 'hypotheses' in ancient Greek medicine, mathematics and philosophy.
OR Discuss the relationship between abstract argument and empirical evidence in Greek antiquity.
- 6 Discuss why either Plato's Timaeus or his so-called theory of ideas was influential. You may restrict your answer to Greco-Roman antiquity.
- 7 **EITHER** Why was natural philosophy taught in the early European universities?
OR Discuss the role of politics and religion in the early teaching of natural philosophy.

- 8 **EITHER** How important was religion as a motivation for studying natural philosophy and mathematics in the Muslim world of the Middle Ages?
OR Discuss the role of Islam in encouraging the court patronage of complex institutions like the observatory, the hospital, the madrasah (university), and the library.
- 9 'Philosophy is the knowledge of divine and human matters' (Gregory Reisch, Margarita Philosophica, 1503). Discuss the transformations of natural philosophy between 1450 and 1600.
- 10 **EITHER** Was an early modern map dangerous or powerful?
OR In what senses was a map a 'scientific instrument' in early modern Europe?
- 11 'Early modern printing was not joined by any obvious or necessary bond to enhanced fidelity, reliability, and truth.' Discuss.
- 12 **EITHER** What roles did scientific instruments play in pre-modern cultures?
OR Was there a 'scientific revolution' in early-modern astronomy?

END OF PAPER

Saturday 3 June 2000 1.30 to 4.30

HISTORY AND PHILOSOPHY OF SCIENCE (2)

Natural and Moral Philosophies

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

SECTION A

- 1 Did a scientific way of thinking emerge in the period 1600 and 1800?
- 2 How did the material culture of the sciences change in the period from 1600 to 1800?
- 3 'tis Ambition enough to be employed as an Under-Labourer in clearing Ground a little, and removing some of the Rubbish, that lies in the way to knowledge' (John Locke, An Essay concerning Human Understanding). Has Locke given an accurate characterisation of the relation between science and philosophy in this period?

SECTION B

- 4 **EITHER** Discuss the place that William Lilly's Christian Apology (London, 1647) holds in the history of astrology in early modern Europe.
OR Why did some people suspect that Cartesianism might lead to atheism?
- 5 'Seventeenth century natural philosophers demoted the "certain" by elaborating a new understanding of the "probable".' Discuss.
- 6 **EITHER** 'Newton was not the first of the age of reason. He was the last of the magicians?' (J.M. Keynes). Discuss this thesis in light of the fact that so many seventeenth century natural philosophers attacked 'occult qualities'. for continuation of question 6
OR Discuss the role and importance of the Royal Society in the reform of natural philosophy and the success of Newtonianism.

- 7 **EITHER** What part does experience play in the construction of knowledge? Discuss this with reference either to Locke and Leibniz, or to Hume.
OR Is Berkeley right in criticising Locke's distinction between primary and secondary qualities?
- 8 **EITHER** 'Natural historical knowledge was vital to the economies of European nations'. Discuss.
OR What was the significance of travel and of Linnaeus's system for eighteenth century naturalists?
- 9 **EITHER** Why is the study of heat more important than the study of electricity for understanding eighteenth century natural philosophy?
OR 'Mesmer's doctrines on magnetism grew out of Franklin's on electricity and their audience or public was more or less the same.' Discuss.
- 10 'Scientific instruments are central to the practice of science. All too often they have been taken for granted. Nonetheless, while most would agree that telescopes and microscopes are scientific instruments, it has proved as difficult to establish a general definition of the category as it has been to define science itself' (Robert Bird, Deborah Warner and Stephen Johnston). Discuss with reference to the seventeenth and eighteenth centuries.
- 11 **EITHER** What is nature, according to Kant?
OR 'There will never be a Newton of the blade of grass' (Kant). Discuss.
- 12 **EITHER** What was new or different in the reorganisation of French academic and scientific institutions, from 1789 to 1815, in comparison with those in England and Germany?
OR Was Cambridge University in the seventeenth and eighteenth centuries a scientific institution?

END OF PAPER

Friday 2 June 2000

1.30 to 4.30

HISTORY AND PHILOSOPHY OF SCIENCE (3)

Science, Industry and Empire

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

SECTION A

- 1 How significant was the part played by the sciences in what Owen Chadwick has called 'the secularization of the European mind' in the nineteenth century?
- 2 Was the making of 'popular' science an inevitable by-product of the emergence of 'professional' science in Europe?
- 3 The middle years of the nineteenth century are often seen as a turning point in European political, religious and social history. Is this also the case for the history of the sciences?

SECTION B

- 4 **EITHER** To what extent is it meaningful to distinguish between the 'public' and 'private' roles of instruments during the nineteenth century?
OR What difference did the 'third dimension' of modelling make in attempts to visualize scientific phenomena during the nineteenth century?
- 5 **EITHER** Was there a 'politics of evolution' in Britain during the 1820s and 1830s?
OR How did changes in the publishing industry during the first half of the nineteenth century affect the development of the sciences? Use examples to support your argument.
- 6 **EITHER** Assess the extent to which Oxford and Cambridge, in the course of the nineteenth century, had become research universities in the German sense.
OR 'Complete subordination to the demands of industrial capitalism.' Is this an appropriate description of scientific innovation in Imperial Germany?

- 7 What do the images (a-d) of Charles Darwin on the attached pages suggest about the use of portraits in the nineteenth century, and the role of the individual man of knowledge?
- 8 **EITHER** 'The French occupation of Egypt has greatly contributed to the enlargement of all the sciences.' (Mémoires sur l'Égypte, An II (1802)) Discuss.
OR What was the 'Laplacian School' of physics, and why was it significant?
- 9 **EITHER** 'The fact is, that the naturalist and the hunter are indispensably necessary to each other' (R. M. Ballantyne, The Gorilla Hunters, 1862). Discuss.
OR How far, if at all, was the triumph of evolutionary ideas of progress related to the growth of colonial empires in the latter decades of the nineteenth century?
- 10 Were the medical experiments in the concentration camps typical of science under National Socialism? Were these experiments science, and does the answer to that question matter?
- 11 **EITHER** 'All attempts to measure the motion of the Earth through the aether failed.' Discuss.
OR Why was Einstein's 1905 paper 'On the electrodynamics of moving bodies' so revolutionary?
- 12 Discuss Einstein's search for a theory of gravity during 1907-15.

END OF PAPER

Thursday 1 June 2000

9 to 12

HISTORY AND PHILOSOPHY OF SCIENCE (4)

Metaphysics, Epistemology, and the Sciences

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

SECTION A

- 1 To what extent is scientific reasoning a matter of logic?
- 2 Could the philosophy of science itself be a science?
- 3 Do scientists know what they are doing?

SECTION B

- 4 **EITHER** Did Logical Positivism mark the victory of science over 19th century metaphysics?
OR 'The philosophy of science of the second half of the 20th century marks a return to Kant.'
Discuss.
- 5 Is reasoning in cases different from other forms of reasoning?
- 6 '[Legal] rules arise out of a process which, while comparing fact situations, creates the rules and then applies them.' (Edward H. Levi) What are the implications of this process for the practice of law and similar professional disciplines?
- 7 **EITHER** 'The law of large numbers provides a connection between the theoretical concept of probability and observable relative frequencies.' Discuss.
OR Is Bayesianism the only rational system for quantifying ignorance?

- 8 **EITHER** 'Past events, present events and future events are all "ontologically on a par".'
Discuss.
OR Describe Newtonian space-time and explain why it was eventually seen as an inadequate foundation for physics.
- 9 **EITHER** Is simultaneity in special relativity a matter of convention?
OR Does the 'grandfather paradox' show that time-travel into the past is impossible?
- 10 **EITHER** Compare and contrast constant-conjunction and counterfactual accounts of causality.
OR What does Goodman's gruesome riddle teach us about laws of nature?
- 11 **EITHER** Does scientific explanation have anything to do with deduction?
OR 'A hypothesis of the form 'All As are B' makes a claim about all objects in the universe, namely that every one of them is either not-A or B.' Discuss in the context of the Raven Paradox.
- 12 **EITHER** Assess the reliabilist approach to the problem of induction.
OR 'There is no stable position between scientific realism and scepticism.' Discuss.

END OF PAPER

Wednesday 31 May 2000

9 to 12

HISTORY AND PHILOSOPHY OF SCIENCE (5)

Science and Technology Studies

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

SECTION A

- 1 Discuss the polemical uses of the history, philosophy, and sociology of sciences. Are such uses ever legitimate?
- 2 'Constructivist methods in science studies were invented to deal with epistemological problems, not issues such as class, community, careers, and gender.' Do you agree?
- 3 Do we live in a scientific society?

SECTION B

- 4 How has the relation of ethics to science changed in the last sixty years?
- 5 According to exponents of the sociology of scientific knowledge, what is social in scientific knowledge?
- 6 **EITHER** Why did British scientists see their participation in World War II as a success story? What were the implications of their views for the future development of British science?
OR 'The scientists can encourage numerical thinking on operational matters, and so can help to avoid running the war by guts or emotion' (P.M.S. Blackett, 1941). Explain and discuss.
- 7 'It is far more differences of mind, than differences of body, that explain the unequal distribution of men and women in science.' Discuss.

- 8 **EITHER** Critically discuss Durkheim's attempt to distinguish between 'natural' and 'social' objects.
OR Critically analyse any one sociological account of the relation between local practices and social structures.
- 9 Who should decide how to resolve disputes in those areas of modern life fundamentally affected by developments in the sciences? Give your answer in relation to either the biomedical sciences or problems of the environment.
- 10 Assess the strengths and weaknesses of the so-called 'new cultural history of the sciences'.
- 11 How useful are biographical approaches in considering the significance of gender in science?
- 12 **EITHER** 'Far from being the agent of the dominant classes, [television] is the prime site where the dominant have to recognize the insecurity of their power...' (J. Fiske). Discuss this view in relation to science programming in Britain.
OR How, why and when did the role of the science reporter emerge as part of modern journalism?

END OF PAPER

Wednesday 31 May 2000

1.30 to 4.30

HISTORY AND PHILOSOPHY OF SCIENCE (6)

History and Philosophy of Mind

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

SECTION A

- 1 'The peculiarity of realism about minds is that its evidence is only ever direct; the peculiarity of realism about matter is that its evidence is only ever indirect. This is why the sciences of mind and of matter have such difficulty meeting.' Discuss.
- 2 Is the concept of mind at any given historical time entirely dominated by the models and methods of investigation that are then available?
- 3 Does a science of the mind necessarily have also to be a science of the body?

SECTION B

- 4 'Children and soldiers benefit from psychological insight during modern wars but it is psychology that benefits most of all.' Discuss.
- 5 Was eugenic theory an influence on British psychology throughout the twentieth century?
- 6 'Every solution to the mind-body problem either makes conscious mental states impossibly spooky or fails fully to acknowledge their existence.' Discuss.
- 7 **EITHER** How could meanings not be in the head?
OR Does belief in other minds require a leap of faith?
- 8 **EITHER** Is Freudian theory an extension of common-sense psychology?
OR Are unconscious mental states irrational?

- 9 Is the Freudian conception of unconscious mind akin to any pre-Freudian view of unconscious mentality?
- 10 **EITHER** 'Freud's theory of sexuality was his most influential and his most controversial contribution.' Discuss in relation either to infantile sexuality or to the differences between the sexes.
OR '?the patient obeys because he is in love with the doctor?'. The analysis of transference is the key to Freud's contribution to therapeutics?. It is perhaps unfortunate that the discipline was named psychoanalysis and not transference analysis. Much misunderstanding would thereby have been avoided' (Lionel Penrose, 1953). Discuss.
- 11 **EITHER** 'Religious cult, idiosyncratic science, professional guild, clinical discipline, modernist movement - the interest of psychoanalysis is that it is the sum of all of these things.' Evaluate this claim.
OR 'Fuck Freud! After what you told me [about Oedipus] I'm afraid to call my mother on the telephone' (Robert De Niro, in *ANALYZE THIS!*). Does this sum up the cultural reception of Freud in the twentieth century?
- 12 **EITHER** How were psychotropic drugs implicated in the cultural anxieties of the second half of the twentieth century?
OR If psychotropic drugs fix the brain what do they leave unfixed?

END OF PAPER

Saturday 3 June 2000

9 to 12

HISTORY AND PHILOSOPHY OF SCIENCE (7)

SPECIAL SUBJECT HISTORY OF MEDICINE (1)

History of Medicine from Antiquity to the Enlightenment

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

SECTION A

- 1 How successful were doctors before the modern era?
- 2 'The construction of medical authority before 1750 always depended more on rhetoric than on any other single factor.' Discuss.
- 3 'Where the philosopher finishes, the physician begins.' Does Aristotle's remark apply to later periods?

SECTION B

- 4 Why were the Greeks so obsessed with disease and with purification?
- 5 How would you account for the popularity of temple medicine in Greco-Roman antiquity?
- 6 In antiquity, what, if anything, changed in the way battle casualties were treated and in the way this treatment was organised?
- 7 Why would anyone in the Middle Ages wish to dissect a human body?
- 8 'Naturalistic illustrations revolutionised the study of botany and anatomy in the sixteenth century.' Do you agree?
- 9 Was William Harvey old-fashioned?

- 10 Compare the fortunes of Galenic and Hippocratic medicine in the late seventeenth and early eighteenth centuries.
- 11 'Obviously the existence of legal medicine is an indication of an advanced stage of civilization. In exposing the true malefactor, and at the same time absolving the innocent?, it protects society and the individual, and provides a more equitable, more effective and more humane jurisdiction. It is therefore not surprising that legal medicine is a very late product of civilization' (E.H. Ackerknecht, 1950). Do you consider this a satisfactory account of the goals of legal-medical practices in the past and of their history?

END OF PAPER

NATURAL SCIENCES TRIPOS Part II

MEDICAL AND VETERINARY SCIENCES TRIPOS Part II

Thursday 1 June 2000

1.30 to 4.30

HISTORY AND PHILOSOPHY OF SCIENCE (8)

SPECIAL SUBJECT HISTORY OF MEDICINE (2)

Modern Medicine and Biomedical Sciences

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

SECTION A

- 1 'The history of modern medicine is the history of its institutions.' Outline such a history and assess its adequacy.
- 2 Have sick people disappeared in the last two hundred years? Why, or why not?
- 3 What is modern about modern medicine?

SECTION B

- 4 'To examine the causes of life, we must first have recourse to death' (Mary Shelley, *Frankenstein*). Discuss in relation to the changes in anatomical approach and practice in Europe between 1780 and 1830.
- 5 'By 1875, public health had come to be defined in terms of plumbing and sewers.' How and why did this come about?
- 6 'Anaesthesia made surgery painless and antisepsis made it safe. We owe the first to William Morton and the second to Joseph Lister.' Critically assess these claims.

- 7 **EITHER** 'Medicine is not a science, but an empirical art' (Samuel Gee, physician to the Prince of Wales, 1888). Account for this statement, and for the introduction of laboratory technologies into clinical medicine.
OR In 1929, the Nobel Prize for Physiology or Medicine was awarded jointly to C. Eijkman and F.G. Hopkins, for 'their contributions to the discovery of vitamins'. What is significant about this citation?
- 8 Does your historical understanding support the view that scientific medicine is in its essence imperialist? Use examples from either the late nineteenth or the late twentieth centuries, or both, in your answer.
- 9 Have scientific views of the human embryo and fetus pushed pregnant women out of the picture?
- 10 Cancer had been perceived as a major health problem since the turn of the twentieth century. What changed after World War II, and why?
- 11 **EITHER** Could the concept of hallucination have developed differently? In what ways?
OR How and why did the concept of neurosis change between 1750 and 1980?
- 12 'Psychiatry has a long past, but a short history.' Discuss.

END OF PAPER