

Friday 28 May 2004 9 to 12

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**.*

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SECTION A

1. 'Ancient Greek science was characterised by competition, the Renaissance equivalents by dogmatic adherence to ancient works.' Discuss.
2. How was the study of nature before 1600 shaped by religious belief?
3. 'There was no such thing as the Scientific Revolution....' (SHAPIN). Is this true?

SECTION B

4. **Either** (a) 'The concept of nature was central to Aristotle's philosophy.' Discuss.
Or (b) How relevant is it to our study of the work of ancient scientists to investigate how—if at all—they earned a living?
5. Are the systems of scientific belief found in ancient Greece and China incommensurable?
6. **Either** (a) Is 'Greek thought, Arabic culture' a good description of the scientific enterprise in medieval Islam?
Or (b) Characterise royal attitudes to astrology in the pre-modern Middle East.
7. How did Alhazen resolve the classical dispute between the Greek mathematicians and physicists over the nature and comportment of vision?
8. Compare and contrast early modern attitudes towards tulips and monsters.
9. **Either** (a) Discuss the role of instruments in the study and representation of the cosmos before the seventeenth century?
Or (b) What did a sixteenth-century astronomer do?
10. 'In the natural sciences the art of oratory is ineffective' (GALILEO). Discuss.

OVER/

11. **Either** (a) Discuss, with reference to the study of nature in the pre-modern period, the distinction between the use of books as historical sources and the use of texts.

Or (b) [Reproduction of frontispiece of Tartaglia's *Nova scientia* (1537)] How well does this image represent the status of mathematics in the early modern period?



END OF PAPER 1

Saturday 29 May 2004 9 to 12

HISTORY AND PHILOSOPHY OF SCIENCE (2)

Natural and Moral Philosophies

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SECTION A

1. Why did natural philosophers perform experiments?
2. 'He that first invented printing, discovered the use of the compass, or made public the virtue and right use of chinchona, did more for the propagation of knowledge, for the supply and increase of useful commodities, and saved more from the grave, than those who built colleges, workhouses, and hospitals' (JOHN LOCKE). Discuss.
3. What was Enlightenment?

SECTION B

4. 'From an early point, the authority of instruments was intertwined with personal authority' (ALBERT van HELDEN). Do you agree?
5. Did the Republic of Letters favour some forms of natural philosophy over others?
6. Does Locke succeed in offering a complete refutation of the doctrine of innate ideas?
7. What were the effects of censorship on the boundaries between natural philosophy and other disciplines?
8. Is Isaac Newton best understood as a lone genius?
9. **Either** (a) Is there, according to Hume, an external world?
Or (b) How good are Berkeley's arguments against the existence of material body?
10. **Either** (a) Where, and by whom, was natural history practised in the eighteenth century?
Or (b) 'Natural history in the eighteenth century was chiefly a science of classification'. Do you agree?
11. Why did natural philosophers encourage international exploration during the seventeenth and eighteenth centuries?
12. Did Kant hold nature to be purposive?

END OF PAPER 2

Thursday 27 May 2004 1.30 to 4.30

HISTORY AND PHILOSOPHY OF SCIENCE (3)

Science, Industry and Empire

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SECTION A

1. Discuss the relation between the sciences and industry in the nineteenth century.
2. Why did the idea that natural science and religious orthodoxy were in conflict gain such currency in Victorian Britain?
3. How did the ideal of disinterested scientific research become established in universities?

SECTION B

4. The boundaries between science and literature in the Victorian period were highly permeable. Discuss with respect to either travel writing or representations of the laboratory in print.
5. 'Love of the marvellous...often loses sight of science, and of truth also' (JOHN MACCULLOCH, 1831). Discuss with relation to the popularisation of geology.
6. **Either** (a) Compare and contrast the institutionalisation of experimental physiology and anthropology in nineteenth-century Germany.
Or (b) What problems faced biologists as they tried to bring their science into universities, and how did they deal with them?
7. In what ways did science under National Socialism resemble and differ from science in the preceding decades?
8. **Either** (a) How do you account for the different receptions of *Vestiges of the Natural History of Creation* (1844) and *On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life* (1859)?
Or (b) Do you agree with Huxley that Darwin was 'the incorporated ideal of a man of science'?
9. 'One word characterizes the most strenuous of the efforts for the advancement of science that I have made perseveringly during fifty-five years – that word is failure' (KELVIN, 1896). Did classical physics fail in its aims?
10. If, as has been argued, the modern evolutionary synthesis brought together Darwin's theory of natural selection with Mendel's discovery of the principles of genetics, why did the synthesis happen in the 1930s, rather than the 1860s?
11. 'Caricatures have no historical value unless they depict facts in the life of the scientist being caricatured' (*Journal of Chemical Education*, 1931). Do you agree?
12. How well does the term 'control revolution' capture the most significant feature of technological change in the late nineteenth and early twentieth centuries?

END OF PAPER 3

Friday 28 May 2004 1.30 to 4.30

HISTORY AND PHILOSOPHY OF SCIENCE (4)

Metaphysics, Epistemology and the Sciences

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SECTION A

1. Is nature like a book?
2. Do different sciences need different philosophies of science?
3. Is science empirical?

SECTION B

4. Should the question whether a particular event c caused a particular event e depend on facts other than those concerning these particular events?
5. 'There does remain the fact that even in endorsing a simple perceptual judgement, and certainly in accepting any theory as empirically adequate, I am sticking my neck out. There is no argument there for belief in the truth of accepted theories, since it is not an epistemological principle that one might as well hang for a sheep as for a lamb' (BAS VAN FRAASSEN) How strong is this defence of constructive empiricism?
6. **Either** (a) What influence did Ernst Mach have on the development of logical positivism?
Or (b) Is Kuhn 'Kant on wheels'?
7. 'If Hume had thought to distinguish reliable from unreliable habits of inference, his own solution to the problem of induction would not have been sceptical.' Discuss.
8. 'The Miracle Argument for scientific realism is an argument from the assumption that most false theories would be unsuccessful to the conclusion that most successful theories are true. The assumption may well be correct; too bad the inference is a blatant fallacy.' Discuss.
9. 'Most of what we believe must be true. Therefore, most of what we are told must be true.' Discuss.
10. 'Testimony is never, except accidentally, a generative source of knowledge.' Discuss.
11. **Either** (a) What do claims about biological functions explain?
Or (b) Can evolutionary theory help us to understand how the human mind works?
12. Can one make inferences in the absence of rules of inference?

END OF PAPER 4

HISTORY AND PHILOSOPHY OF SCIENCE (5)

Science and Technology Studies

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SECTION A

1. Is scientific knowledge political?
2. 'Every scientist should receive a training in ethics.' Do you agree?
3. 'The heart of science is technology.' Discuss.

SECTION B

4. **Either** (a) 'Historians of science should never use categories that were unavailable to the persons they study.' Discuss.
Or (b) Can historians of science hope to provide causal explanations of changes in past beliefs?
5. **Either** (a) Are there any sociological differences between laboratory sciences and field sciences?
Or (b) 'Scientists know so much about the natural world by knowing so much about whom they can trust.' (SHAPIN) Discuss.
6. 'Race or hereditary descent is everything, it stamps the man.' (ROBERT KNOX, 1850). Is 'race' a scientific invention?
7. What is gained and what is lost when the sociology of scientific knowledge becomes a model for the sociology of technology?
8. **Either** (a) How useful is 'Big Science' as a category to analyse developments in the physical and life sciences in the twentieth century?
Or (b) How significant was involvement in Second World War radar research to the emergence of new specialties and disciplines in the post-war period?
9. In what sense can one speak of a sea-change in attitudes towards science and technology in the 1960s and '70s?
10. **Either** (a) 'No branch of science has created more acute or more subtle and interesting ethical dilemmas than genetics' (JOHN HARRIS and JUSTINE BURLEY). Is this true?
Or (b) Does the freedom to choose one's own life justify the use of sex selection technologies or donated gametes?

OVER/

11. **Either** (a) How useful is the concept of 'embodiment' in the anthropological study of mathematics?
- Or** (b) What do we learn from a comparison of the material culture of mathematics in the ancient Middle East and pre-conquest America?
12. **Either** (a) 'Feminist historians suggested that focusing on users and use rather than engineers and design would enable historians to go beyond histories of men inventing and mastering technology' (N. OUDSHOORN and T. PINCH, 2003). Discuss with reference to reproductive technologies.
- Or** (b) 'The history of technologies of human reproduction is simply the history of applying techniques that were first developed on other animals.' Discuss.

END OF PAPER 5

Wednesday 26 May 2004

1.30 to 4.30

HISTORY AND PHILOSOPHY OF SCIENCE (6)

History and Philosophy of Mind

Before you begin read these instructions carefully:

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SECTION A

1. 'Since the end of the nineteenth century, psychology has been dominated by three models: the clinical (Charcot), the experimental (Wundt) and the psychometric (Galton).' Discuss.
2. 'In the judgment of the lay public everyone has to rely on psychological knowledge in making his or her way through the world. How could anything offered by experts compete with a lifetime of experience in human affairs?' (KURT DANZIGER). How have scientists of the mind responded to this challenge?
3. 'We are ill-suited to study minds, because the only tools we have for the task are themselves minds.' Discuss.

SECTION B

4. Is the compulsory treatment of the mentally unwell ever justified?
5. Has the concept of mental symptom always existed?
6. **Either** (a) Can we have an adequate psychology without making appeal to unconscious mental states and events?
Or (b) How does a psychoanalytic explanation *explain*?
7. **Either** (a) What were the sources for Freud's claim that a talking cure could definitively cure the neuroses?
Or (b) '*The Interpretation of Dreams* was antiscientific because Freud so forcefully dismissed all previous writers that he actually aborted an emerging experimental tradition.' (J. ALLAN HOBSON, 1988). Discuss.
Or (c) 'Psychoanalysis inadvertently became more of a cultural movement than a scientific organization; that was both its strength and its fundamental weakness.' Discuss.
8. How persuasive are historians' attempts to account for projects of the mechanisation of intelligence in terms of social context?
9. Can computers have representational states?
10. **Either** (a) Would the impossibility of deducing mental properties from physical properties establish dualism?
Or (b) Can dispositions determine the extension of a concept?
11. 'By '+' I mean ADDITION since I am disposed to give sums in response to queries of the form 'z+y= ?'.' Evaluate this claim.
12. **Either** (a) Was war a laboratory for psychological thinking in twentieth-century Britain?
Or (b) How was child psychology in Britain after 1880 shaped by its use of measurement and its pursuit of objectivity?

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

Saturday 29 May 2004

1.30 to 4.30

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

History of Medicine from Antiquity to the Enlightenment

Before you begin read these instructions carefully:

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SECTION A

1. Does retrospective diagnosis have a legitimate role in the history of medicine?
2. 'The poor had no need of learned medicine in Europe before 1800.' Discuss.
3. 'The hospital was an institution of confinement rather than cure'. Discuss.

SECTION B

4. **Either** (a) Why were disputes between rival ancient medical traditions concerning the causes of diseases apparently so difficult to resolve?
Or (b) 'Hippocratic medicine failed Greek women'. Discuss.
5. What were the differences between classical Graeco-Roman medicine and Byzantine medicine?
6. In their reactions to epidemics did learned physicians and civil authorities demonstrate a shared view of disease causation?
7. What can we learn about the functions of hospitals from their architecture?
8. Did the Reformation have a greater impact on medical communications in England than the arrival of printing?
9. **Either** (a) What was new about Renaissance anatomy?
Or (b) In what ways was Paracelsian and Helmontian medicine Christian?
10. What was 'mechanistic medicine'? Discuss its origins and fate.
11. Discuss the role of religious dissenters in medical developments in eighteenth-century England.
12. Account for the great interest in madness in the eighteenth century.

END OF PAPER 7

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

Thursday 27 May 2004

9 to 12

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

Modern Medicine and Biomedical Sciences

Before you begin read these instructions carefully:

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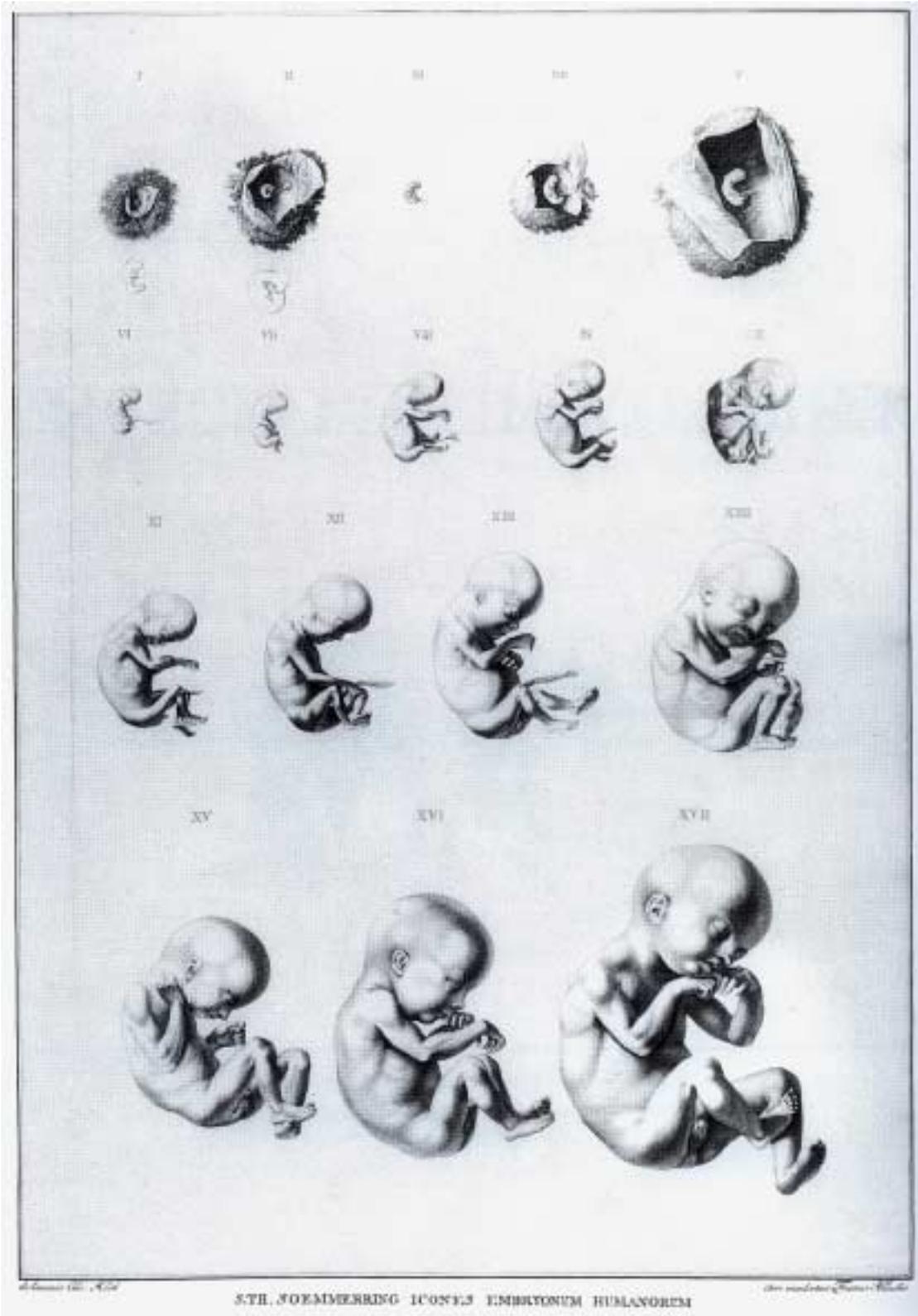
SECTION A

1. How were new disciplines created in nineteenth-century medicine?
2. What difference had science made to medicine by the eve of World War I?
3. 'Framing disease' (CHARLES E. ROSENBERG, 1992). Discuss the advantages and disadvantages, in writing about the modern history of disease, of the metaphor of diseases as 'framed' and as 'framing'.

SECTION B

4. The stethoscope is the emblem of the clinical medicine of early nineteenth-century Paris. To what features of that medicine does the instrument owe its success?
5. Is it possible to explain historically why the European disciplines investigating the human body changed so radically between 1780 and 1820?
6. Was there a revolution in microscopy in the early nineteenth century?
7. 'All that we admire and respect in the true woman as womanly is merely dependent on her ovaries' (RUDOLF VIRCHOW, 1848).
'Physicians are the natural advocates of the poor and the social question falls to a significant extent within their jurisdiction' (RUDOLF VIRCHOW, 1848). Explain the significance of and explore the relations between these two statements.
8. Survey and account for the various forms of opposition to the laboratory revolution in medicine.
9. Was medicine a tool of empire in the nineteenth and early twentieth centuries?
10. 'Since the Second World War, we have lived in the age of biomedicine.' Discuss.
11. The plate reproduced on the next page is from S. T. Soemmerring's *Icones embryonum humanorum* (Images of human embryos) of 1799. These engravings have been called 'images of human embryos for our time: heralds of a redefinition of the perception ... of the pregnant woman and her body' (BARBARA DUDEN, 1999). Discuss.
12. 'Psychiatrists once helped their patients confront the tragedy of human existence; now they are uneasy purveyors of the latest quack remedies of a multinational industry.' How useful is this description of the historical development of psychiatry?

OVER/



J. STR. SOEMMERRING ICONES EMBRYONUM HUMANORUM

END OF PAPER 8