

NST Part II, History and Philosophy of Science: Senior Examiner's Report, 2011

39 students sat the HPS Part II Examination this year, the same number as in 2010. Only 11 students took option B (including an extra examination paper, but no dissertation), compared to 14 last year. 1 further candidate took Paper 7 and 3 took Paper 8, as part of BBS Part II. One Classics Tripos student took Paper 1. The final results for the HPS Part II comprised 11 Firsts overall (28%), 25 Upper Seconds (64%) and 3 Lower Seconds (8%), an almost identical distribution to last year.

32 candidates sat the BBS History and Ethics of Medicine (HEM) paper, a 50% increase on last year's 21. Three students also wrote dissertations. The examiners awarded 7 Firsts (22%), 18 Upper Seconds (56%), 5 Lower Seconds (16%), and 1 Third (3%).

Class and mark distributions

12 out of 27 HPS Part II dissertations were awarded Firsts (44%), and two attracted marks in the 80s. The mean mark for the dissertations (69.1) was significantly higher than for the written papers (66.6). Only 2 dissertations received a Lower Second. 15 students were awarded Firsts for their combined performance in the Primary Source essays (38%), and just 1 each a Lower Second and Third. The mean mark for Primary Source essays was 67.8.

<i>Paper</i>	<i>Candidates</i>	<i>First</i>	<i>Upper Second</i>	<i>Lower Second</i>	<i>Third</i>	<i>Mean Mark</i>	<i>Median Mark</i>	<i>Standard Deviation</i>
1	9+1 Class.	20%	80%	—	—	67.3	67.0	3.7
2	11	27%	55%	18%	—	66.9	67.0	5.8
3	17	18%	71%	12%	—	66.3	67.0	5.2
4	18	28%	56%	17%	—	66.5	68.0	7.3
5	15	20%	53%	27%	—	65.4	65.0	4.8
6	21	29%	62%	10%	—	68.1	68.0	4.2
7	13+1 BBS	21%	79%	—	—	67.9	68.0	3.7
8	17+3 BBS	20%	75%	—	5%	65.2	66.5	7.4
9	9	22%	67%	11%	—	66.2	66.0	5.5
Dissertation	27	44%	48%	7%	—	69.1	69.0	6.4
Primary Srce	39	38%	56%	3%	3%	67.8	68.0	5.2
Option A	27	30%	63%	7%	—	67.2	67.0	3.9
Option B	12	25%	67%	8%	—	67.4	68.1	4.5
Male	21	33%	62%	5%	—	68.0	69.0	3.9
Female	18	22%	67%	11%	—	66.3	66.9	4.1
All	39	28%	64%	8%	—	67.2	67.7	4.0

Table 1: Distribution of marks by paper, option, and gender (excluding HEM)

A higher proportion of Option A (dissertation) students got Firsts than Option B students, but the mean and median marks of Option A and Option B students were very similar. By contrast, male candidates outperformed female candidates by nearly 2 percentage points, and were 50% more likely to get Firsts. This was not because men preferred Option A;

indeed, while 69% of all students chose Option A, only $13/21 = 62\%$ of men did so, compared $14/18 = 78\%$ of the women.

Examining practices

Examination questions were set at the examiners' meeting in Lent Term, following consultation with supervisors, lecturers and paper managers. The External Examiner (John Henry) also provided valuable comments on the draft papers.

As is always the case, all elements of the course (dissertations, primary source essays and examination papers) were blind-double-marked. In a handful of cases examiners' independent marks diverged considerably. Most of these cases were resolved satisfactorily by a third internal examiner; a few were referred to the External Examiner. He was also asked to comment on the general calibration of examiners to each other, and to national standards.

Once again, the examiners reported no concerns about the reporting of medical and pastoral issues by colleges or the Applications Committee. But once again several scripts of papers sat in colleges were missing cover sheets or had information attached to them that compromised candidate anonymity. There were no problems with illegible scripts this year.

Examiners were comfortable using the full range of marks through the 70s but felt wary of moving beyond 80. To help examiners calibrate at the upper end of the performance range, we recommend that the Board consider introducing a Starred First class for individual question and paper marks of 80 and above (with suitable classing criteria). The Board may also wish to consider a Starred First class for the whole degree, perhaps based on a combination of marks profiles (Firsts in all components) and/or a mean mark in the mid-70s.

The examination process ran with great efficiency and good humour, thanks to the professionalism and collegiality of my fellow internal examiners, the External Examiner, and the departmental office staff.

General comments on examination performance

Primary Source Essays and Dissertations

In general, students should be discouraged from using questions as primary source essay titles. Essays on the Darwin source which speculated about the motives of the letter-writers were less successful than those which reflected on the norms of letter writing amongst Darwin and his contemporaries. The Drama of Life essays were mostly excellent. The strongest combined detailed readings of images, attention to historical moments when they were produced, and solid arguments situated within appropriate secondary literature.

Dissertations were often impressive, showing a great deal of research and original thinking.

Examination Papers

There was no significant reuse of materials between Sections A and B, although several students usefully made cross-references to the other answers they had given on the paper. As so often, the examiners were concerned that the reproduction of lecture notes and/or pre-prepared supervision essays continued to be a popular, if unrewarding strategy. The best answers were often given to questions which allowed candidates to present a range of answers (for instance, the question "Where does mathematics come from?" in Paper 5).

We recommend that some guidance be given to lecturers and Paper Managers—who are often not examiners—on ways of formulating engaging and productive exam questions

which solicit a range of appropriate responses to material covered in the course, while discouraging wholesale reproduction of predigested material. Indeed, given the radical changes to Paper content this coming year, the Board may wish to consider inviting Paper Managers to draft specimen papers late in Michaelmas or early in Lent, and to use these as a basis for developing lecturers' exam-setting techniques.

Paper 1: Classical Traditions (9 HPS candidates + 1 Classics)

Answers were unevenly distributed, both in Section A (with only one candidate answering Q2 and 6 answering Q3), and in Section B (with none of the questions on ancient Greek materials being answered, while 9 out of 10 answered one of the questions on Assyrian materials, 4 a and b). The weaker answers to section A questions, especially to Q1, were well informed, but historiographically naïve. In particular, the concept of "classical" caused a fair amount of confusion even in the better answers. Similarly, answers to Q11 produced several unashamed Big Picture accounts without any historiographical reflection. The answers on Assyrian materials were difficult to mark. The questions elicited descriptive answers with very little differentiation among candidates. The answers on Arabic science were remarkably varied and of good to very good quality.

<i>Question</i>	<i>Answers</i>
1. What makes a 'classical tradition' in the sciences?	3
2. To what extent was the history of the sciences in the pre-modern period linked to the spread of literacy?	1
3. How important was the creation of new knowledge to scholars and natural philosophers in the periods before 1600 AD?	6
4a. Why did the Assyrian king need scholars at court?	7
4b. How successfully did cuneiform scholarship adapt to the end of indigenous rule in Babylonia?	2
5. Anaximander (6th century CE) has been credited with having produced 'the first specimen of a new genre, the treatise <i>Peri Physeōs</i> , "On the Nature of Things".' Discuss the significance of this new genre.	–
6a. 'The puzzle is not why the ancient Chinese did not invent the axiomatic-deductive method of proof, so much as why certain Greeks did.' Discuss.	–
6b. Is there any neutral way to evaluate the strengths and weaknesses of the cosmologies in Aristotle's <i>On the Heavens</i> and in <i>Huainanzi</i> ?	–
7. 'Astronomy can be understood to be the oldest of the sciences, because of its reliance on instruments.' Discuss.	1
8. 'Arabic science had become autonomous by the eleventh century CE.' Discuss.	6
9. 'Arabic science is a conduit through which Greek scientific ideas became known to Latin Europe.' Evaluate this statement.	4
10. How and why were classical traditions useful to Renaissance natural philosophers?	5
11. How should we write the history of natural philosophy?	4
12. Why did it take so long for the toxic properties of mercury to be taken seriously?	1

Paper 2: Natural Philosophies (11 candidates)

The questions answered were reasonably evenly distributed, with the most popular Section A question being Q 1 and the most popular in Section B being Qs 9 and 4. Only Q6b and

Q11 elicited no answers. Overall, the majority of candidates performed very well, with a number of excellent scripts. The tail end was of low quality, however. As so often, answers to Section A questions tended, with some exceptions, to be the weakest. The best scripts displayed a high level of historiographical awareness and sophistication, both in Section A and in Section B answers. Many candidates discussed the use of “science” in the questions, with several simply declaring that they would equate “science” to either “natural philosophy”, or “natural philosophy + natural history”. Questions on the history of natural history, especially Q9 elicited very high quality answers, while there were many uneven performances in answers to Q4.

<i>Question</i>	<i>Answers</i>
1. What, if anything, was new about the organization of knowledge production in early modern Europe?	5
2. ‘Historians are in no doubt that there were connections between reverence for science and irreverence toward religion’ (John Brooke, <i>Science and religion: some historical perspectives</i>). Discuss with reference to the development of natural knowledge between 1600 and 1800.	3
3. How, if at all, did travel change European notions of nature and culture between 1600 and 1800?	3
4. Did magic turn into science in the seventeenth century?	7
5. How important were observatories in generating new astronomical knowledge in early modern Europe?	2
6a. Did alchemists do experiments?	2
6b. Why were some forms of astrology legitimate and others not?	–
7. How did seventeenth- and eighteenth-century natural philosophers decide which observations were ‘real and perfect’ (Robert Hooke)?	2
8. Why were seventeenth-century discussions of novelty so concerned with tracing origins?	3
9. In what ways was eighteenth-century natural history an economic practice?	8
10. Compare and contrast the significance of <i>Principia mathematica</i> and of <i>Opticks</i> in Isaac Newton’s natural philosophy.	2
11. ‘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?	–
12a. Why were collections so indispensable for early modern naturalists?	2
12b. ‘The disagreements between Buffon and Linnaeus went far deeper than classification.’ Discuss.	5

Paper 3: Science, Industry and Empire (17 candidates)

The answers to this paper were distributed very unevenly, with clear favourites in both Section A (Q3) and Section B (Q8b) which were answered by about three-quarters of the candidates. By contrast, Qs 1, 5a and 5b attracted no responses at all. Weaker answers tended to give sketchy narrative overviews of the topics discussed with shallow analysis and contextualisation. The best answers were able to situate individual scientific ideas and events within a larger historical framework.

<i>Question</i>	<i>Answers</i>
1. What roles did audiences and institutions play in generating consent in	—

	nineteenth-century science?	
2.	To what extent, if at all, did science supplant religion as a way of understanding the natural world during the nineteenth century?	5
3.	How was it possible for the public to know more about science during the nineteenth century, even as access to the places where science was done became increasingly limited to specialists?	12
4.	How and why did the scientific relevance of Biblical Assyria change over the course of the nineteenth century?	4
5a.	Compare and contrast the uses of geological, anthropological and zoological evidence used in Victorian debates over man's place in nature.	—
5b.	'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?	—
6.	How was the nineteenth-century novel experimental?	3
7.	'The kitchen is a chemical laboratory' (1821). What kinds of science could be done in the nineteenth-century home?	8
8a.	How did the display of imperial prizes, commodities and goods contribute to the making of nineteenth-century scientific knowledge?	2
8b.	How did nineteenth-century scientists make use of imperial networks?	13
9a.	'The physical laboratory system has now become quite universal. No university can now live until it has a well-equipped laboratory' (Sir William Thompson, 1885). Discuss.	6
9b.	Compare and contrast the nineteenth-century development of the observatory and of the laboratory.	6
10.	Was Charles Darwin's the most important evolutionary theory of the nineteenth century?	4
11.	Was Alexander von Humboldt as much a man of empire as he was a man of science?	3
12.	Did late nineteenth-century physical sciences support or refute materialism?	2

Paper 4: Metaphysics, Epistemology and the Sciences (18 candidates)

The answers were very unevenly distributed both in Section A (where Q2 had only 3 takers), and in Section B, where Q10 had just one and Qs 11-12 only 2 each, against the 15 answers to Q6 and 12 to Q4. As is usual with the philosophy paper, the best scripts displayed considerable sharpness and originality. The tail end was particularly weak on the Section A questions. Many answers to Questions 4, 6 and 7 were very similar in content and structure, apparently having a common source. There was a slight problem of overlap in the two questions on scientific realism, 1 and 7.

	<i>Question</i>	<i>Answers</i>
1.	Is scientific realism just common sense?	6
2.	Do different sciences have different methods?	3
3.	Can science explain everything?	9
4.	Is it true that the Big Bang is a cause of your birth?	12
5.	'There are no laws of nature because all universal generalizations are only accidentally true.' Discuss.	4
6.	Is the reliabilist justification of induction question-begging?	15
7.	Is it possible for scientific realists to avoid the pessimistic induction from the	8

	history of science?	
8.	Is the theory of evolution testable?	8
9.	Is the human mind like a Swiss-Army knife?	6
10.	Have there been cases in which chemists working in the same area of study exhibited divergent epistemic values? If so, is this significant?	1
11.	'Relativity theory is deterministic; quantum mechanics is indeterministic.' Discuss.	2
12.	How was the logical positivist view of the nature of scientific theories challenged by later philosophers?	2

Paper 5: Science in Society (15 candidates)

Overall, this paper produced some of the weaker performances of the examination. To a large extent unsatisfactory answers were produced when candidates failed to consider all the key words of a question. For instance, many answers to Q5 failed to address the notion of invisibility, and responses to Q8 ignored the first half of the statement to be discussed. Answers to Q3 tended to confuse science policy with science journalism. As already noted above, the best answers were given to Q7, which imaginatively deployed a range of material from across several components of the course.

	<i>Question</i>	<i>Answers</i>
1.	What are the implications of sociology of science for science policy?	4
2.	What does anthropology bring to the study of scientific communities?	1
3.	What is social about scientific knowledge?	10
4a.	What should a study of 'co-production of knowledge' show?	1
4b.	Is the concept of 'experimental system' useful for sociology of science?	1
5.	How does the sociology of science make sense of scientists' references to and invocations of invisible entities like 'the gene' or 'the electron'?	4
6.	Can scientific writing be distinguished from other forms of persuasion?	9
7.	Where does mathematics come from?	11
8.	'When there is nothing else to trust, people trust numbers.' Discuss.	4
9.	Why and how did colonial medical practices attempt to intervene into African bodies and families? To what extent were they successful?	2
10.	What is the value of an ethnographic approach to understanding medical research in contemporary Africa?	1
11a.	'Gender is located above, sex below the belt.' Discuss.	9
11b.	Discuss Voltaire's statement that 'Émilie du Châtelet was a great man whose only fault was being a woman.'	–
12.	How should we educate for scientific and/or mathematical competence and confidence?	3

Paper 6: History and Philosophy of Mind (21 candidates)

Performance on Paper 6 was consistently high, with marks clustering round the upper 60s. There were clear favourites amongst the questions. In Section A, overall the answers to Q3 were fairly successful, while students struggled with the more 'historical' Q1. In Section B, Q4 was the most popular. More than 2/3 of the students tackled this question, mostly attracting good marks. We were slightly concerned about Q10b, where it seemed that several students did not have much grasp of literary or artistic movements in the 20th century, and

struggled to give specific named examples of artists or themes rather than generic ideas about how psychoanalysis *might* have influenced artists and writers.

	<i>Question</i>	<i>Answers</i>
1.	Does the history of the mind sciences teach us which are the best – and also the worst – methods for studying the mind?	3
2.	Is there an unconscious mind?	6
3.	Why, given that we have immediate access to the mind, do we have such difficulty in acquiring scientific knowledge of it?	12
4.	Describe and criticize the Cartesian argument for distinguishing mind and matter.	15
5a.	Could any sort of mental state or event be what it is in virtue of its functional role?	6
5b.	Is it reasonable to fear a future pain whatever psychological changes precede it?	2
6.	Could you be somebody whom somebody else remembers being?	9
7.	How should we think in general terms about the relationship between the meanings of words and the mental representation of the world?	9
8.	Can psychoanalysis explain anything?	2
9.	Freud (1900) claimed that the study of dreams demonstrated that ‘the most complicated achievements of thought are possible without the assistance of consciousness’. What followed from this demonstration?	5
10a.	How could Freud propose a revolutionary theory of human sexuality without making any direct experiments on human bodies or undertaking direct observation of human sexual behaviour?	10
10b.	Why have writers and artists been so influenced by psychoanalysis?	5
11.	What can the history of the psychoanalytic movement teach us about the history of modern science in general?	1
12a.	Should Michel Foucault’s <i>The History of Madness</i> be renamed <i>The History of Psychiatry</i> ?	—
12b.	Is schizophrenia a natural kind?	5

Paper 7: Medicine from Antiquity to the Enlightenment (13 HPS candidates + 1 BBS)

In general, candidates focussed on the narrow constraints of the question rather than situating its subject within broader concerns in the history of medicine. Very few scripts discussed gender, which seemed peculiar given that this is a major focus of the primary source. The answers to the leprosy question were especially good.

	<i>Question</i>	<i>Answers</i>
1.	Explanations of the causes and treatments of disease remained more or less static before 1750. Discuss.	7
2.	Why is it useful for historians of medicine to study the social and religious contexts of healing from Antiquity to Enlightenment?	5
3.	From the ancient to the early modern worlds, is the role of women in medical care best characterized as a history of change or of continuity?	1
4.	Who was involved in healing the sick in ancient Mesopotamia, and how?	6
5.	‘The history of Roman medicine is inseparable from that of Greek medicine.’ Discuss.	—
6a.	‘The average doctor was on the social level of an artisan, possessing neither	3

	wealth nor importance.’ To what extent is this true of Graeco-Roman society?	
6b.	What problems did sick people face in selecting treatment in the ancient world?	–
7a.	Were medieval responses to the Black Death grounded more in fear of God than belief in doctors?	5
7b.	‘Leper by the will of God.’ How does this statement help us to understand medieval responses to leprosy?	8
8a.	‘The learned medicine of the schools had little to do with how medicine was practised in medieval Europe.’ Discuss.	3
8b.	‘All those illiterates – barbers, sorcerers, landlords, tricksters, counterfeiters, alchemists, bawds, go-betweens, midwives, old women, converted Jews, Saracens – proclaim themselves surgeons.’ (Henri de Mondeville, 1260–1320; surgeon). How accurately does de Mondeville reflect the range of medical practitioners in the Middle Ages?	1
9.	To what extent did the social and economic status of medieval and early modern patients determine how and where they were treated?	7
10.	How should we assess the impact of print technology on medical communications in England between 1450 and 1640?	3
11.	Was medicine a trade or a profession in early modern Europe?	4
12.	What did it mean for medicine to ‘work’ in early modern Europe?	2

Paper 8: Modern Medicine and Biomedical Sciences (16 + 3 BBS)

There were clear favourites amongst the questions. Section A questions tended towards lists of facts without much historical analysis; synthetic thought was confined to brief introductions (if at all). Question 1 was also slightly problematic as students did not always distinguish between medical *technologies* and medical *interventions* or *practices*.

	<i>Question</i>	<i>Answers</i>
1.	‘Medical technologies have not shaped society. Rather, society has shaped medical technologies.’ Assess for the nineteenth and twentieth centuries.	9
2.	‘Modern medicine is based on knowledge gained by experiment, and this is the secret of its success.’ Discuss.	2
3.	‘Big promises and bigger disappointments.’ Is that a fair summary of the history of science in medicine since 1789?	5
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?	6
5.	Who was viewed as responsible for preventing disease in Victorian cities?	7
6.	‘Women are marked out by nature for very different offices in life from those of men’ (Henry Maudsley, 1874). How, then, did the first women doctors justify their place in the medical profession?	6
7.	Were there really two great revolutions in surgical practice during the nineteenth century?	13
8.	‘It makes no sense to speak of a “standard model” for the production of industrial pharmaceuticals when this was organized so differently in different countries at different times.’ Discuss.	3
9.	‘The medical establishment has become a major threat to health’ (Ivan	5

	Illich, 1976). What was 'the medical establishment' and why did Illich and others criticize it so fiercely?	
10a.	How did 'scientific management' change medicine in general and physiology in particular?	—
10b.	What does it mean to say that theories of human physiology have shifted 'from fixed capacities to performance enhancement'? Is this an accurate description of changes between c.1880 and 1950?	2
11a.	'An ongoing trend towards medicalization.' Is this phrase a useful summary of the history of pregnancy and childbirth since 1750?	11
11.b	Is it generally true that reproductive technologies have been developed on animals first and then applied to women?	1
12.	Have doctors been leaders in 'global health' and should this be their role?	2

Paper 9: Images of the Sciences (9 candidates)

Answers were on the whole well distributed among questions, although Questions 9b, 10b and 12 had no takers. Q2 was the most popular in Section A with 5 takers and Qs 9, 10 and 11 were the most popular in section B with 5 takers each.

The quality of the scripts was on the whole good, with some excellent performances. The weakest answers were not well focused on the questions. The question on logical positivism produced some excellent answers. Judging from the answers they elicited, some of the questions seemed to be too complex — e.g. Q9a, in spite of its popularity.

	<i>Question</i>	<i>Answers</i>
1.	'What has history to do with me? Mine is the first and only world' (Wittgenstein). Is this a reasonable attitude for a scientist?	3
2.	Why has it been claimed that science is free of values?	5
3.	What (if anything) does philosophy of science have to do with ideology?	1
4.	Is Berkeley's instrumentalist view of science defensible?	2
5.	Does the rejection of corpuscularianism necessitate the rejection of Locke's primary/secondary quality distinction?	4
6a.	Is Hume a sceptic? Discuss with regard to either the idea of cause and effect, or the existence of external bodies.	1
6b.	Did Kant answer Hume on causation?	1
7.	Did Kant believe nature to have a purpose?	1
8.	What distinguished Logical Positivism from other types of empiricism?	3
9a.	How did twentieth-century French historians of science challenge the view that the sciences have shown continuous progress?	5
9b.	How did twentieth-century historians of science challenge the view of science as largely independent of its social settings?	—
10a.	When, if ever, are historians of science entitled to use concepts and information that were not available to those they study?	5
10b.	Both Bachelard and Foucault developed histories of the sciences which were also inextricably philosophical. Is this a strength or a weakness?	—
11.	Is the view that science evolves merely a metaphor?	5
12.	Do portraits reveal the scientist's inner being like a window, or are they a mask to conceal what lies beneath?	—

History and Ethics of Medicine (32 candidates)

In general, stronger answers went beyond the lecture notes.

	<i>Question</i>	<i>Answers</i>
Q1	'Plague killed master and servant alike.' Did everyone in medieval and early modern Europe respond to an epidemic of plague in the same way?	24
Q2	Did Renaissance physicians prioritize ancient authority or first hand observation as sources of medical knowledge?	10
Q3	What does it mean to say that medicine was 'commercialized' during the seventeenth century?	4
Q4	What were the most significant changes in medical education and medical practice between the eighteenth and nineteenth centuries?	13
Q5a	Explain what caused contagious disease, and who was responsible for preventing it, in the industrializing cities of nineteenth-century Britain.	4
Q5b	Consumption, tuberculosis, TB: were these all the same disease? Consider, where relevant, symptoms, diagnosis and treatment.	—
Q6	'Woman is a pair of ovaries with a human being attached, whereas man is a human being furnished with a pair of testes' (Rudolph Virchow, 1848). How have such opinions affected medical theories and practices in the twentieth century?	2
Q7	Does the justification of informed consent lie in the protection of patient autonomy?	12
Q8	What implications, if any, does the doctrine of double effect have for the permissibility of euthanasia?	20
Q9a	'There is no difference between health and disease because health cannot be defined.' Discuss.	6
Q9b	How is the treatment/enhancement distinction morally relevant?	5
Q10	'The non-identity problem has an easy solution: if faced with a choice between more benefit and less, one should always choose the former.' Discuss	11
Q11	When, if ever, should we be worried about health outcome inequalities? Justify your answer.	5
Q12	Who should pay for healthcare if you fall ill, and why?	12