

NST2HP

Natural Sciences Tripos Part II: History and Philosophy of Science

Paper 1: Early History of Science, Medicine and Technology

Also Paper O11 in CLT2 Classical Tripos Part II

You should answer three questions. All questions carry equal weighting.

You should spend no more than three hours on answering all the questions, and a word limit is set of no more than 1,500 words per answer.

All your answers for this paper should be submitted in one DOC, DOCX or PDF document. Each answer should be clearly headed with the question number and the question.

Put your Blind Grade Number (BGN) at the start of the document. Do not put your name anywhere in the document.

1. Why were there changes in early modern European astronomy?
2. What was the difference between a “rational physician” and a “quack” in early modern Europe?
3. What was the Black Death, and how has the way in which scholars have studied it changed over the past three decades?
4. Is it possible to write histories of the experiences of health and healing of people in the past who did not write things down? Provide at least three examples.
5. “Images and objects made medicine more ‘objective’.” How true is this of early modern medical knowledge in Europe?
6. Did new diseases lead doctors and their patients to use new remedies in early modern Europe?
7. How did specific substances, for example theriac, asafetida, or snakestones, reflect foreign influences on Chinese medicine in the imperial period?

8. How did changes in the publishing industry in the Ming and Qing dynasties affect the history of medicine in imperial China?
9. "Early modern collections were reflections of how their owners sought to appear." Discuss.
10. How did chemical knowledge transform medical practice in early modern Europe?
11. What was the significance of travel in the development of Enlightenment natural knowledge?
12. Explain the significance that automata had for eighteenth-century natural philosophers.

END OF PAPER

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Paper 2: Sciences and Empires

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1. What role did mines and mining play in the formation of modern science?
2. “Every ambitious scientist ... is a son of Humboldt. We are all his family” (Emil du Bois-Reymond 1849). Why would a nineteenth-century scientist say so?
3. “Both anthropology and colonialism were expanding heartily at the ‘Darwinian moment’” (Philippa Levine). Discuss this statement.
4. What role, if any, did submarine telegraphy play in the development of physics as a discipline?
5. Why was the maintenance and repair of scientific instruments such a significant challenge for practitioners of the “survey sciences” in the nineteenth century?
6. What was “Dutch learning” (*rangaku*) and what significance did it hold for the history of science in Tokugawa Japan?
7. Discuss the relationships between science and society in Republican China during the early twentieth century.
8. At what point(s) during the twentieth century could Japan be considered a technocratic state, and why?

9. How have seeds been used as instruments of state and imperial control, and what understandings of plant biology and human nature underpinned this use?
10. How did imperialism shape the methods and ideas of conservation?
11. How and by whom have “natural resources” been made? Your answer should compare at least three kinds of these “resources”.
12. What is the place of the Manhattan Project in the history of Big Science?

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Paper 3: Modern Medicine and Life Sciences

You should answer three questions. All questions carry equal weighting.

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1. Assess the case for *and* against the view that the French Revolution marks a sharp break in medical history.
2. Assess the claim that new technologies revolutionized surgery in the nineteenth century.
3. Why did some medical practitioners in the nineteenth century remain unconvinced that bacteria caused disease?
4. Why did some elite English physicians reject science in the early twentieth century?
5. What made medical experiments involving human subjects controversial in the twentieth century?
6. How have the practices associated with the term “international health” changed over the twentieth century?
7. Why has so much reproductive technology been directed at women’s bodies rather than men’s bodies?
8. According to Warwick Anderson, tropical medicine around 1900 relied on “essentialized race culture, more than the old notions of distinct racial physiologies.” Discuss this claim.

9. In what ways, if at all, did plantation economies in the Atlantic world accentuate racial difference as an important subject for modern medical theory and practice?
10. “To create is to recombine” (François Jacob, 1977). What does this statement tell us about twentieth-century ideas of evolution?
11. How did collecting practices in the life sciences change – or not – from the end of the nineteenth century to the beginning of the twenty-first?
12. Use two historical examples to show how model organisms have enabled *and* constrained research in twentieth-century biology.

END OF PAPER

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Natural Sciences Tripos Part II: History and Philosophy of Science

Paper 4: Philosophy and Scientific Practice

Also Paper HPS4 in PBT2 Psychological and Behavioural Sciences Tripos Part II

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1. Rational choice modelling is the essence of economics. Discuss.
2. Does economics need value judgements? If no, why not? If yes, which ones?
3. "Folk psychology has no place in a legitimate scientific study of cognition." Do you agree?
4. Under what conditions, if any, is extended cognition possible?
5. "To say that biological generalizations are evolutionarily contingent is to say that they are not laws of nature" (John Beatty). Discuss.
6. What is the best analysis of the concept of biological function?
7. Are mental disorders physical disorders?
8. What are the advantages and disadvantages, if any, of classifying certain mental health conditions as cases of neurodiversity rather than disorders? Answer with reference to a specific example.
9. Does relativity theory show that there is no fact as to what is going on right now in the Andromeda Galaxy?

10. Should ordinary notions of time or causation play any role in understandings of contemporary physics?
11. Does being healthy require more than merely being free of disease?
12. If you could design the evidentiary standards for regulatory drug approval, what would they be?

END OF PAPER

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Natural Sciences Tripos Part II: History and Philosophy of Science

Paper 5: Epistemology and Metaphysics of Science

Also Paper HPS5 in HPT3 Human, Social and Political Sciences Tripos Part IIB and Paper 6 in PHT1 Philosophy Tripos Part IB

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1. Choose and describe one example of the use of probability in science or in the philosophy of science. What is the best way to understand *that* notion of probability?
2. How can the principles of Bayesian reasoning be used to offer solutions to problems in the philosophy of science?
3. Are laws the ultimate aim and achievement of science?
4. Can epistemic voluntarism assist in the defence of constructive empiricism?
5. Which explains the success of science better: the truth of theories, or evolutionary selection?
6. Is the knowledge of structures more secure than other kinds of scientific knowledge?
7. Does perspectival realism really qualify as realism?
8. How well does the correspondence view of inter-theoretic reduction apply to the relation between classical genetics and molecular genetics?

9. Are experiments epistemically privileged, either in comparison to simulations, or in comparison to passive observations?
10. How do models differ from theories?
11. Does string theory qualify as science?
12. What, if anything, do all scientific explanations have in common?

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Paper 6: Ethics and Politics of Science, Technology and Medicine

Also Paper HPS6 in HPT3 Human, Social and Political Sciences Tripos Part IIB

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1. Do contrasts between validity and credibility matter in the sciences?
2. What role does tacit knowledge play in scientific experimentation?
3. Is there such a thing as a distinctively Marxist approach to science? Discuss with reference to historical examples.
4. When and why have scientists considered themselves activists?
5. Do the benefits of algorithmic decision-making outweigh the risks?
6. "If solutions within this system are so difficult to find, then maybe we should change the system itself" (Greta Thunberg). Discuss with reference to the historical relationship between climate change and capitalism.
7. Are there any important ethical differences between Pronuclear Transfer (PNT) and Maternal Spindle Transfer (MST)?
8. Are there any good reasons to refrain from modifying the human germline?
9. Who should get scarce vaccines first?

10. Does diversity guarantee objectivity?
11. "Technology is value neutral." Do you agree?
12. Should policy-makers always defer to scientists?

END OF PAPER