

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 four questions in total. Answer one question from Section A and three questions from Section B. 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, so no more than 6,000 words for the whole paper.

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.

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SECTION A

1. What was the role of images in early modern medicine and science?
2. How did the discovery of America change European science and medicine?
3. "Early modern medicine is a footnote to Galen." Discuss.

SECTION B

4. Account for the longevity of astrology as a guiding principle of healing in early medicine.
5. Were hospitals or households the most important places for healing in early medicine?
6. "Blood-letting was the most common and widespread form of medical intervention in early medicine." Discuss.

7. What, if anything, is wrong with the notion of the early modern medical marketplace?
8. How did the Black Death change attitudes to health and medicine?
9. To what extent is it possible to write a history of patient experiences of illness and healing in medieval and early modern Europe? What methods and sources would you use to do so?
10. Were scientific societies the key institutions for the development of natural philosophy between 1600 and 1800?
11. What part did medicinal drugs have in practices of healing around 1700?
12. Discuss the relative importance of value, taste and order in natural history collections over the early modern period.
13. What role did the Jesuits play in the history of Chinese medicine?
14. “‘Have the courage to use your own understanding’ is the motto of Enlightenment” (Immanuel Kant, “What is Enlightenment?”, 1784). Does this motto accurately characterise eighteenth-century medicine and natural philosophy?
15. What role did commercial interests play in promoting eighteenth-century European sciences?

**END OF PAPER**

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## **Paper 2: Sciences and Empires**

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### SECTION A

1. “Since the seventeenth century, the predominant ontological understanding of the world has been its calculability” (Stuart Elden, 2015). Assess this claim.
2. Have diffusionist models for the spread of knowledge, such as that proposed by George Basalla in 1967, actually been abandoned?
3. To what extent does the history of twentieth-century sciences involve a shift in focus from physical to biological phenomena?

### SECTION B

4. How did the Jesuit strategy of accommodation shape scientific exchanges between late imperial China and Europe?
5. Why did the *Beagle* have a naturalist on board?
6. What effect did the arrival of the Black Ships of Matthew Perry have on science and technology in Japan?

7. What role, if any, did the display of people in public exhibitions have in the development of anthropology?
8. How did the status of physics laboratories change during the nineteenth century?
9. To what extent was the “Darwinian revolution” a debate about Britain’s imperial future?
10. What role did the brewing industry have in shaping new biological research agendas around 1900?
11. How have anthropologists challenged understandings of “universal economic man”?
12. Why did the May Fourth Movement call for the adoption of science and democracy in China?
13. Was Bronisław Malinowski’s self-critique his greatest contribution to anthropology?
14. How did eugenicists and racial anthropologists define purity and why was it an important concern to them?
15. Offer a history of the computer that does not centre on the machine.

**END OF PAPER**

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### **Paper 3: Modern Medicine and Life Sciences**

You should answer four questions in total. Answer one question from Section A and three questions from Section B. All questions carry equal weighting.

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#### SECTION A

1. What kind of science has played the largest role in the development of medicine since 1750? Why?
2. "Historians of modern medicine and life sciences have focused too much on hospitals and laboratories and too little on textbooks and newspapers." Assess this claim.
3. Discuss the significance of international networks to the history of medicine and the life sciences since 1800.

#### SECTION B

4. Were nineteenth-century medical practitioners "quintessentially modern heroes"?
5. Some historians have described cholera as the "emblematic disease of the nineteenth century"? Do you agree.

6. Why was it so difficult for radiographs to become the standard means of diagnosing various medical conditions, despite the relative ease with which Roentgen's discovery of x-rays could be replicated?
7. Account for the incorporation of laboratory technologies into clinical medicine in the decades around 1900.
8. "Inevitably, as I see it, we can look forward to something like a penicillin for cancer, and I hope within the next decade" (Cornelius Rhoads, 1953). Contextualize this claim.
9. What difference did activism make to medical science between the 1960s and the 1980s?
10. Are medical technologies gendered? Discuss in relation to the obstetric forceps and the oral contraceptive pill.
11. How did efforts to define racial difference affect medical practice in British colonies in the nineteenth century?
12. How does the history of sickle-cell anaemia reflect broader transformations in the relationship between race and medicine over the course of the twentieth century?
13. Explain the difference between vertical and horizontal approaches to international health, using historical examples.
14. Evelyn Fox Keller maintains that the twentieth century was the "century of the gene". Do you agree?
15. What role have natural history museums played in the development of modern 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*

You should answer four questions in total. Answer one question from Section A and three questions from Section B. All questions carry equal weighting.

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SECTION A

1. Do all sciences need natural kinds?
2. Is there a general account of explanation, suitable for all sciences?
3. Objectivity is a common aim of the sciences. Discuss.

SECTION B

4. Is welfare economics right to rely on preference satisfaction?
5. Is rational choice modelling good science?
6. Does biology need a new “reciprocal” account of causation?
7. Are claims about current biological functions really claims about past selection regimes?

8. Suppose someone has a benign tumour growing inside of them. It is not causing any symptoms. Do they have a disease?
9. Is evidence from a randomised trial on drug X sufficient to infer that X is or is not effective?
10. What are the benefits and harms of a disease screening programme? How should these be measured?
11. Should psychiatric disease categories be defined in the same way as disease categories in the rest of medicine?
12. All mental disorders are culture-bound. Discuss.
13. Are people with addiction responsible for their behaviour? Why or why not?
14. Did Gödel show that time travel is possible?
15. Does new physics force us to update our understanding of time, space, or causation? Discuss with reference to an example.

**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*

You should answer four questions in total. Answer one question from Section A and three questions from Section B. All questions carry equal weighting.

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SECTION A

1. Does science make progress? If so, how?
2. Do philosophers of science need to attend to the details of how scientists work?
3. "Science is in the truth business." Do you agree?

SECTION B

4. "If two theories account for the evidence we have, then it is irrational to choose between them." Do you agree?
5. "It is not an epistemological principle that one might as well hang for a sheep as for a lamb." How, if at all, does this comment support van Fraassen's constructive empiricism?

6. Should we be structural realists?
7. Are there any important differences between experiments and simulations? If so, what are they? If not, why not?
8. Is String Theory science? Explain your answer.
9. Can we “intervene cellularly/molecularly, track behaviourally” (Bickle 2006)? What does the answer to this question imply about the reducibility of mental states to brain states?
10. What can scientific practice tell us about the possibility of reduction?
11. Is a model’s capacity to facilitate inferences about its target necessary for scientific representation? Is it sufficient?
12. “Whether a scientific claim is a law depends on the agents who use it.” Discuss.
13. How, if at all, are laws and regularities related?
14. “The probability of rolling a 2 on a fair die is  $1/6$ .” What does this statement mean?
15. What is the base-rate fallacy? What is its philosophical significance?

**END OF PAPER**

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Natural Sciences Tripos Part II: History and Philosophy of Science

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

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

You should answer four questions in total. Answer one question from Section A and three questions from Section B. All questions carry equal weighting.

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SECTION A

1. Is it helpful to say that science is always political?
2. What, if anything, should we trust scientists to do?
3. "If you saw a sausage being made, you would never eat one again." Does understanding how scientific knowledge is made undermine its credibility?

SECTION B

4. Should sociologists of science offer the same kind of explanations of true and of false beliefs?
5. "Events are discoveries not in virtue of how they appear in the mind, but how they are defined in and by a cultural criterion" (Brannigan). Do you agree?
6. What role did science play in Maoist thought?

7. Does Communism require a distinctive approach to science policy? Discuss with reference to historical examples.
8. What form of value, if any, attaches to human embryos?
9. Is there anything wrong, morally speaking, with intervening in the human germ line?
10. What is the therapeutic misconception and does it pose problems for the ethics of consent?
11. Does it matter when the Anthropocene began?
12. Can social interactions guarantee objectivity?
13. Can scientific justification be “value-free”? Does this matter?
14. Paul Bloom argues that “if you want to be good and do good, empathy is a poor guide”. Martin Hoffman argues that empathy is the “bedrock of morality”. Can the science of empathy resolve their dispute?
15. Are brain images epistemically privileged in any way?

**END OF PAPER**