

NST Part IB History and Philosophy of Science
Senior Examiner's Report
July 2024

1. The examination process

As in previous years, the Part IB HPS examination consisted of two papers: History of Science (HPS/1), and Philosophy of Science (HPS/2). The examiners were Dmitriy Myelnikov (senior examiner), Anna Alexandrova, Matt Farr, Marta Halina, Joshua Nall and Dániel Margócsy. There was no external examiner.

Candidates sat two three-hour open-book online exam papers: HPS/1 (History of Science) and HPS/2 (Philosophy of Science). For each exam, candidates answered 4 questions from a choice of 12 (1 out of 2 Section A questions; 3 out of 10 Section B questions). For each exam, students were given a 3-hour window between receiving the exam paper and completing their answers, and a 15-minute window for submitting their exam scripts via Moodle. The HPS/1 exam took place on Wednesday, 22 May 2023, and HPS/2 on Wednesday, 5 June 2023. There were no notable incidents during the examinations, to the examiners' best knowledge. All candidates with registered disabilities were accommodated appropriately, also to the examiners' best knowledge.

Drs Nall, Margócsy and Myelnikov read the History of Science scripts, and Drs Alexandrova, Farr and Halina read the Philosophy of Science scripts. Each script was blind double-marked. On each paper, any given examiner read 2/3 of the scripts, the rota being arranged so that each pairing of examiners was assigned 1/3 of the whole set. A numerical mark out of 100 was given by each examiner to each script as a whole, and that mark was agreed between the two examiners in each case; in very few cases, agreement was reached with the help of the remaining examiner. Each script was marked by individual examiners question-by-question, but final marks for candidates were agreed between the two markers based on their overall marks for the candidate. Where there were disagreements in these marks, individual question marks were discussed and considered.

The HPS Part IB Final Examiners' Meeting was held on 19 June, to agree all marks and discuss any issues. In preparation for this meeting, the two groups of markers for each paper met independently with the Senior Examiner on 10 June (HPS/1) and 18 June (HPS/2) to discuss each script in detail.

2. The subject examiners' meeting, and recommendations arising from it

The HPS Part IB Final Examiners' Meeting on 19 June was attended in-person by all examiners. Marks on the individual papers, HPS/1 and HPS/2, had all been agreed at the prior meetings on 10 and 18 June, and were combined to provide an overall mark for each candidate. The agreed raw marks did not meet the expected grade distribution and so the scaling formula was used.

In two cases for HPS/1, concern had been raised over academic misconduct (plagiarism and insufficient acknowledgement of quoted text) prior to the Final Examiners' Meeting. Both cases were forwarded to the Chair of Examiners for NST Part IB and investigated in accordance with the established procedures.

Overall, the examiners have expressed some dissatisfaction with the timed open-book format, noting the tendency for answers to regurgitate prepared material, and at times likely copy and paste from notes. As we discuss the future of HPS IB examination format (see **section 5**), **the examiners have recommended lowering the maximum word count from 1,500 words to 1,200 words for each answer** to discourage excessive description or reproduction of prepared material, and to focus the candidates' attention on answering the questions posed.

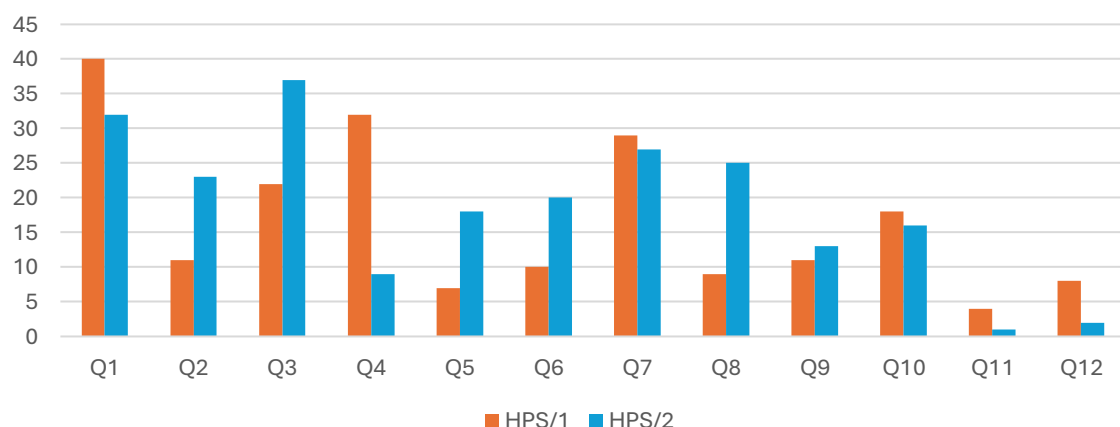
3. Summary of results

A total of 40 NSTIB candidates sat both papers; 11 non-standard candidates sat HPS/1, 17 non-standard candidates sat HPS/2. After scaling, the results for NSTIB consisted of 20.0% firsts, and 60.0% firsts-and-2is. The average mark was 62.59 and standard deviation 7.7. One (non-standard) candidate withdrew.

4. Comments on performance on individual questions

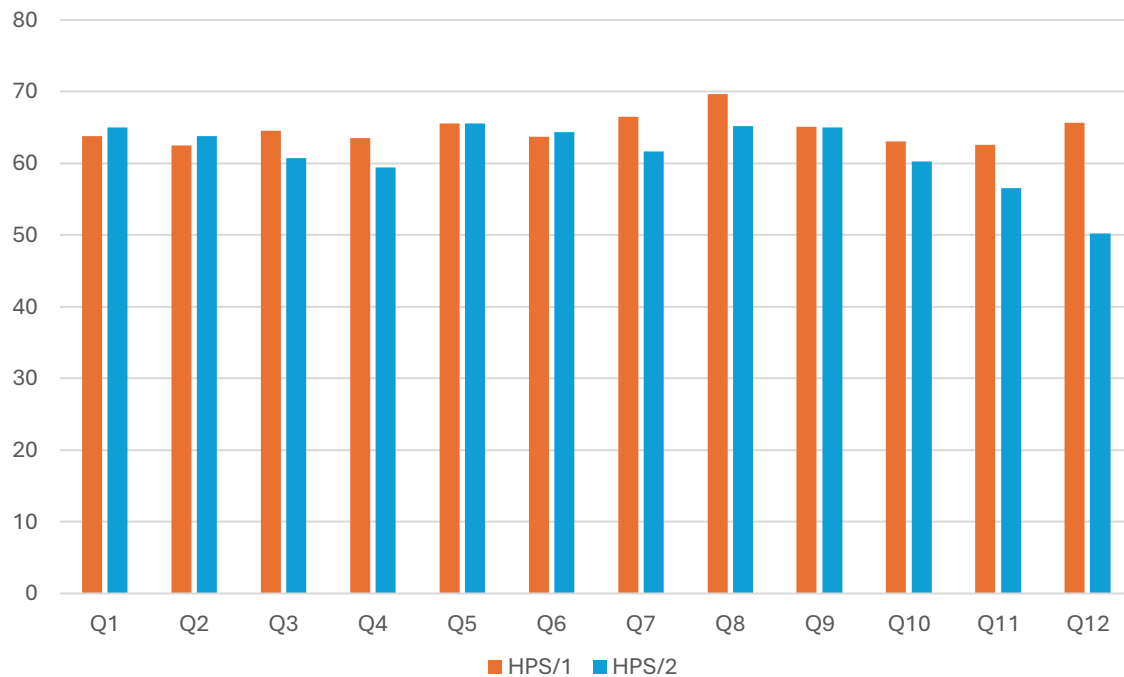
As in previous years, there was some unevenness in the distribution of candidates tackling different questions. For Section A, there was unevenness in HPS/1 with a strong preference for Q1 (40 out of 51). For Section B, there was uneven distribution in both exams. For HPS/1, there were spikes on Q4 (32 out of 51 candidates chose this), and Q7 (29 out of 51). For HPS/2, Q3 was answered by nearly two-thirds of the candidates (37 out of 57). This was a question on falsification, such questions seeing large spikes also in previous years.

Distribution of answers



	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12
HPS/1	40	11	22	32	7	10	29	9	11	18	4	8
HPS/2	32	23	37	9	18	20	27	25	13	16	1	2

Average mark by question



	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12
HPS/1	63.81	62.50	64.55	63.48	65.57	63.70	66.45	69.67	65.14	63.06	62.63	65.69
HPS/2	65.02	63.76	60.68	59.44	65.58	64.33	61.67	65.16	65.00	60.28	56.50	50.25

HPS/1 History of science

Q1. Is revolution a useful term in describing scientific change?

This was by far the more popular section A question, answered by 40 out of 51 candidates. Best answers engaged with historiography of the Scientific Revolution and revolutions more broadly. The weaker answers accepted progressivism at face value. Some candidates decided to make this a question about Kuhn, which was a valid choice; the better answers in that vein offered strong historical examples.

Q2. How did technologies of communication shape the sciences?

This was the less popular Section A question, and overall, not answered very successfully. There were few examples from post-1900, and most answers focused on print and telegraphy, both represented in lecture materials. With hindsight, perhaps the question was too challenging for IB level.

Q3. Discuss the role of the Americas in the making of early modern science and medicine.

This was a relatively popular question, with competent and sometimes excellent answers. The best answers engaged with indigenous knowledge and two-way

exchanges and did not just treat the Americas as a source of novelty for European science and medicine.

Q4. What was the role of experiment in the development of early modern knowledge?

This was the most popular Section B question, with 32 out of 51 candidates choosing it. Weaker answers conflated observation with experiment uncritically, and reproduced information without clear structure or argument. The best answers reflected on Dear, Shapin and Schaffer, especially on the social aspects of witnessing experiments and generating assent.

Q5. What was the role of translation in knowing nature in early modern Asia?

This question attracted a moderate number of answers. These were overall strong, even though all relied on very similar materials from the lectures. The best answers dealt with the diverse meanings of translation in this period and region.

Q6. "Between 1600 and 1800, natural knowledge-makers became less interested in qualities, and more interested in quantities." Is this a fair assessment?

This was a moderately popular question, but with few inspiring answers. The weaker answers demonstrated a lack of understanding of "qualities" in this context.

Q7. Was industrialisation the most important factor in the development of the sciences in the nineteenth century?

This was the second most popular Section B question, with 29 out of 51 candidates choosing it. Overall, the answers were solid but rarely exciting. Most candidates pointed out deep links between imperialism and industrialisation; a few made the essay overwhelmingly about the former thus not quite answering the question.

Q8. How were hospitals in early-nineteenth-century France like museums, and why did that matter?

Few candidates chose this question, but those who did mostly gave impressive answers. The best answers engaged with how *both* museums and hospitals in Revolutionary France were organised, and not just the birth-of-the-clinic narrative.

Q9. How does the history of geology reflect relationships between science and empire in the nineteenth century?

The answers to this question covered very similar examples but were good overall. The best answers engaged with how imperial relations manifested themselves in geological knowledge as well as in mining and prospecting.

Q10. How did science shape the Cold War?

This was a relatively popular question, with mostly competent (if rather generic) answers. Most answers focused on nuclear technologies and the space race, and

none engaged with the material on biomedicine. Some candidates focused excessively on the Manhattan project, which, while highly relevant, predated the Cold War so should not have been the core focus of a good answer.

Q11. Why did the concept of “biodiversity” become influential in the second half of the twentieth century?

This was an unpopular question: 4 out of 51 candidates chose it. The best answers appreciated that the question was specifically asking about biodiversity as a concept and a means of structuring ecological concerns, while weaker answers discussed the rise of twentieth-century environmentalism more generally. With hindsight, the question was probably too narrow in scope.

Q12. What useful insights, if any, can the history of climate science bring to policy today?

8 candidates out of 51 answered this question. This question invited some excellent answers from candidates clearly passionate about the issue, and some more poorly structured ones.

HPS/2 Philosophy of Science

Q1. “Value-laden knowledge is not trustworthy.” Discuss.

Stronger essays defined the terms clearly and anticipated possible objections to their arguments. Weaker essays failed to define ‘trustworthiness’, or ended up arguing for the value-ladenness of science but did not address its trustworthiness.

Q2. Is science just whatever scientists do?

Many candidates answered the question by writing an essay on demarcation. The strongest essays commented on how absurd or tautological the question might be if read completely at face value. Few answers discussed the pragmatics of scientific institutions or diversity of methodology.

Q3. Is it ever possible to show a scientific hypothesis to be false? And does it matter?

Weaker answers uploaded their knowledge on falsificationism rather than directly address the specific question posed, especially the second half. Some of the best provided positive accounts of how science might progress even if hypotheses cannot be shown to be false. Few candidates considered the more pragmatic implications in their answers.

Q4. “Non-replicable single occurrences are of no significance to science.” Do you agree?

Few students opted to answer this question. For those who did, there was, in general, insufficient effort to define ‘single occurrence’. Some took the question to be about the replication crisis, which is a reasonable reading, but those answers did not engage with philosophical literature on replication.

Q5. What positive role, if any, do social factors play in the sciences? Discuss in relation to a specific example.

This was a popular question, but many candidates answered it in ways that overlapped with Q1, focusing on social factors *as values*, but not on institutions or funding. Stronger essays took time to delineate what social factors might mean. Few candidates took the instruction to relate the essay to a specific example sufficiently to heart.

Q6. Is psychiatry fundamentally different from other areas of medicine?

Stronger answers adopted a more comparative stance and spent time considering other areas of medicine. Weaker answers focused on symptom-based diagnosis without thinking beyond psychiatry.

Q7. Does consciousness pose a unique problem for the scientific study of the mind?

Candidates took a variety of approaches to consciousness, and the best essays stressed the ambiguity in defining it. Weaker answers tended to summarise philosophical theories of the mind rather than defend a particular view.

Q8. Name and discuss one specific way in which developments in physics have altered our understanding of time.

OR "Philosophy makes no material contribution to physics." Discuss.

Most candidates who answered this question opted out for the second option. For the first option, the best answers focused on a specific example, as instructed. Weaker answers did not sufficiently explain the understanding of time *both* before and after the change they discussed. For the second option, weaker essays made the question about whether physics needs to be empirical. Stronger essays considered the role of philosophical reasoning in the foundations of physics.

Q9. Are there special challenges that all and only social sciences face?

Weaker answers tended to focus on the demarcation aspect of the question ('*only*') but did not consider the challenges that *all* social sciences might share. The best answers addressed both parts of the question.

Q10. Is there ever a good reason to censor scientists?

Weaker answers took as an opportunity to air their intuitive ideas about restrictions on scientific freedom without much effort to justify their position. Stronger answers considered the dual-use dilemma and harm principle and approached the question critically.

Q11. What is the most problematic aspect of the precautionary principle?

One student answered this question, insufficient to spot trends.

Q12. Are species individuals?

Two students answered this question, too few to spot trends.

5. Thoughts for future years

While the examiners expressed clear preference for typed over handwritten scripts, there was a unanimous sense that in the short-to-medium term, IB assessment should move away from the open-book online format to the ‘in-person, invigilated, typed examinations’ as outlined in the University’s Framework for Assessment. The growing popularity and sophistication of generative AI models, as well as the tendency to copy-and-paste rather than properly engage with questions, were both raised as significant risks for the future of open-book online exams.

The examiners considered the pedagogical advantages of open book exams, notably that they can relieve the pressure to memorise information, thus giving candidates space to focus on building arguments, and allow for stronger engagement with key readings. In practice, however, we felt that this format encourages quilting essays from notes, carries greater risks of unintended plagiarism, and is vulnerable to potential uses of generative AI. Another question raised was whether memory is a useful skill that should be tested in assessing a candidate’s knowledge of history and philosophy of science, and, relatedly, whether limited prepared notes (e.g. an A4 sheet) might be allowed in an invigilated exam. In any case, as noted in **section 2**, the examiners recommend shortening the IB answer word limit to 1,200 words starting in Easter Term 2025.

As HPS Part II moves to coursework-only assessment (dissertation and portfolio of essays), we may wish to implement similar changes to HPS IB in the longer term, depending on the progress of the Part II assessment experiment and the practical limitations of teaching and supervising HPS IB.