

Study Questions for Mid-term Examination

From Newton to Reid

1. Summarize the argument between Leibniz and Newton's defenders, such as Clarke, over absolute versus relative or substantivalist versus relationalist views of space.
2. How does Leibniz ground the principle of the identity of indiscernibles?
3. What is your view on the question whether spatial situation, alone, suffices for the individuation of objects?
4. Outline Reid's views on the role of analogies in science.
5. Explain Reid's views on the nature and status of common sense principles in science.
6. Critically assess Reid's claims regarding the kinds of arguments that can be adduced to support the assertion that a given common sense principle is a necessary truth. Is ridicule really a legitimate form of argumentation in this context?

Kant

7. Summarize the "incongruent counterparts" argument and explain its importance for Kant's doctrine of space.
8. Explain what Kant means by the claim that space is the necessary a priori form of outer intuition and time the necessary a priori form of inner intuition. How is Kant's doctrine of intuition embedded in his larger philosophical project? And in what way, mainly, does it represent a critique of Humean empiricism?
9. In the *Metaphysical Foundations of Natural Science*, Kant wrote, "I maintain . . . that in every special doctrine of nature only so much science proper can be found as there is mathematics in it." Explain what this means and give a sketch of Kant's project in this book.
10. Compare and contrast the interpretations of the *Metaphysical Foundations of Natural Science* given by Brittan and Friedman.
11. In what manner, according to Kant, do Newton's three laws of mechanics, or their Kantian surrogates, have an a priori status?
12. In your view, can Kant's project withstand the pressure that will be exerted on it by general relativity and quantum mechanics?

From Comte through Mill: Positivism and the Debate over Induction

13. What are the main features of Comte's version of positivism?
14. What did Comte mean by "social physics"? How does he understand the development of such a field's bringing to completion the positive philosophy?
15. Give a comparative and critical assessment of the views of Comte and Whewell on the relationship between history of science and philosophy of science.
16. Describe the way in which developments in science in the latter eighteenth and early nineteenth centuries served as a stimulus to the development of a richer inductive logic. What were the principal contributions to this history of thinkers like Herschel and Whewell?
17. Contrast the views of Mill, Whewell, and Herschel on abductive inference in the sciences.
18. Whewell was interested in the employment of abductive inference not only in natural science but also in natural theology, viewing it as a belief-warranting form of inference in both domains. Do you think that he is right to do so?

Maxwell and Hertz on Models in Science

19. How did the Scots Common Sense tradition in philosophy shape Maxwell's thinking about scientific method?
20. Discuss Maxwell's understanding of the role of models in science.
21. Heinrich Hertz is widely regarded as the founder of the *bildtheoretische* view of theories, the view that theories are models. What does that mean for Hertz, and how does his view of the role of models in science differ, if at all, from that of Maxwell?
22. Many have argued that Maxwell and Hertz's according a fundamental role to models in science entails a commitment to some form of scientific realism. What is your view? Answer this question either historically or systematically.
23. What were the developments in science in the mid-nineteenth century that stimulated philosophical interest in questions about the role of models in science?
24. Comte wanted to carve out a separate institutional and intellectual space for philosophy of science as a form of reflection on science. By contrast, Herschel, Whewell, Maxwell, and Hertz are impressive examples of what some term the "philosopher-scientist," a kind of thinker rarely seen since Einstein. What are the implications for both science and philosophy of the choice between these two models?