Philosophy of Science
Dr Hilary Greaves, Somerville College

Topic 1: Verification and Falsification

Essay title:

“Is Popper’s criterion of ‘falsifiability’ for a scientific statement any improvement on the logical positivists’ ‘Verifiability’ criterion? Does either survive Quine’s criticism?”

Core Reading


K. R. Popper, *The Logic of Scientific Discovery* (Hutchinson, 1959), chapter I (pp. 27-48) and chapter IV (pp. 78-92).


I. Lakatos, *Philosophical Papers*, volume I (Cambridge, 1978), Chapter 1, section 2 (pp. 10-46) and Appendix (93-102).


Further Reading
*A broader exegesis of logical positivism.*

*Duhem’s version of Quine’s criticism.*

*Exegesis of the threat to falsification in Duhem and Quine’s work.*

*Two critical exegeses of Popper.*

*More detail on the logical positivists.*
**Topic 2: Kuhn's picture of science**

**Essay title:**

“To what extent does Kuhn’s model of scientific revolutions undermine the idea of science as a rational, truth-seeking enterprise?”

**Core Reading**

J. Ladyman, *Understanding Philosophy of Science* (Routledge, 2002). Chapter 4 (pp. 93-128).  
*This is a textbook presentation of Kuhn’s ideas, with some discussion of them.*

T. S. Kuhn, *The Structure of Scientific Revolutions*, 2nd edition (Chicago, 1970), especially chapters 2-6, 10-12, and postscript (but read the whole book if you can).


**Further Reading**

*A slightly higher-level critical discussion of Kuhn.*

*Reviews the development of Kuhn’s thought since his book: argues that the notion of “incommensurability” between theories has changed drastically in Kuhn’s work.*

Topic 3: Explanation

Essay titles (suggested – choose one):

“What is the best analysis of scientific explanation? What are its weaknesses?”

“What is the Deductive-Nomological theory of explanation? How effectively does it describe scientific explanation, and how can it be improved or replaced?”

“Is explanation merely a pragmatic notion?”

Core Reading


Further Reading


D. H. Ruben (ed.) *Explaining Explanation* (Routledge, 1990). Ch. 1, Ch. 4-7. An extract is reprinted in Curd and Cover (eds), one of the anthologies on my “general reading”.


and/or

Topic 4: Induction and confirmation

Essay title:

“What is the paradox of the ravens, and what lesson should we draw from it?”

Core readings:


D. Gillies, Philosophy of Science in the 20th Century, Ch.2.3., Blackwells 1993.

N. Goodman, Fact, Fiction, and Forecast, Ch.3, Cambridge: HUP.

Further reading:


K. Popper, The Logic of Scientific Discovery, Ch.1-5.


P. Feyerabend, Against Method


Topic 5: Scientific Realism

Essay title:

“Does either the underdetermination of theory by data or the pessimistic meta-induction succeed in undermining the plausibility of scientific realism?”

Core Reading

and/or


S. Psillos, *Scientific Realism* (Routledge, 1999), chapters 4 (the positive case for realism), 5-6 (the case against the pessimistic meta-induction), and 8 (the case against underdetermination of theory by data).

Further Reading

*general:*


*on underdetermination:*


**Topic 6: Constructive empiricism**

**Essay title:**

“Does constructive empiricism provide a viable alternative to scientific realism?”

**Core Reading**

J. Ladyman, *Understanding Philosophy of Science* (Routledge, 2002). Section 6.2 (pp. 185-195).


**Further Reading**


J. Ladyman, “What’s really wrong with constructive empiricism?: van Fraassen and the metaphysics of modality”, *British Journal for the Philosophy of Science* 51 (pp. 837-856).

**Topic 7: Structural realism**

**Essay Title**

What is structural realism? Does it improve on traditional realism, or is it just a variant on it?

**Core reading**


**Further reading**


Topic 8: Laws of nature

Essay title:

"What is a law of nature?"

Core reading:


Further Reading:


B. Van Fraassen, Laws and Symmetry (OUP, 1991), Part I. Available via Oxford Scholarship Online. Chapters 3 and 5 are critiques of Lewis's and Armstrong's views respectively.

(There is an interesting symposium on this book in Philosophy and Phenomenological Research 53 (1993), with comments by Nancy Cartwright, David Armstrong, and John Earman, with van Fraassen's replies. All available on JSTOR. Links here: http://users.ox.ac.uk/~ball0402/teaching/phisci.html)
