

TOPICS IN PHILOSOPHY OF SCIENCE (PHIL20019)

TIME AND PLACE: Wednesdays 10:00-11:00, Lecture Theatre 1.

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Office hours (Room B37): Wednesdays 11:00-12:00
Thursdays 17:00-18:00

This course is divided into three major themes: 1) Laws and Entities, 2) Explanation and Inference to the Best Explanation, and 3) Scientific Revolutions. The aim of the course is to provide a probing look into some of the central debates in the philosophy of science.

Here are some of the main questions we will be looking at: What is the relation between observation and theory? Is the distinction between observables and unobservables warranted? What is a natural kind? Are there any natural kinds? Do we have epistemic access to them? What is a law of nature? How does it differ from other laws? Do natural laws tell us how things *must* behave? What is a scientific explanation? Is it necessary for a scientific explanation to appeal to laws of nature? What is the role of explanation in scientific inferences? Does anything survive scientific revolutions? What is the import of history in the philosophy of science?

Main Textbooks

Bird, A. (1998) *Philosophy of Science*, London: Routledge.

Curd, M. and Cover, J.A. (eds.) (1998) *Philosophy of Science: The Central Issues*, New York: W.V. Norton & Company.

Coursework:

One essay to be handed in to the department by **09/12/05**. Suggested essay topics will be distributed nearer the deadline.

WEEK 1: Observation and Theory

Essential Reading:

Fodor, J. (1984) 'Observation Reconsidered', *Philosophy of Science*, vol. 51(1): 23-43.

Further Reading:

Duhem, P. ([1914] 1991) *The Aim and Structure of Physical Theory*, Princeton (NJ): Princeton University Press.

Hanson, N.R. (1958) *Patterns of Discovery*, Cambridge: Cambridge University Press.

Kosso, P. (1992) *Reading the Book of Nature*, Cambridge: Cambridge University Press.

Maxwell, G. (1962) 'The Ontological Status of Theoretical Entities', in Curd and Cover, pp. 1052-1063.

Van Fraassen, B. C. (1980) 'Arguments Concerning Scientific Realism', in Curd and Cover, pp. 1070-1075.

WEEK 2: Natural Kinds

Essential Reading:

Bird, A. (1998) *Philosophy of Science*, ch.3, pp. 95-120.

Further Reading:

Goodman, N. (1954) *Fact, Fiction, and Forecast*, Cambridge, MA: Harvard University Press.

Kripke, S. (1972) *Naming and Necessity*, Oxford: Blackwell Publishers.

Putnam, H. (1975) 'The meaning of "meaning"', in *Mind, Language, and Reality: Philosophical Papers*, vol. II, Cambridge: Cambridge University Press.

Quine, W.V.O. (1969) 'Natural Kinds', in *Ontological Relativity and Other Essays*, New York: Columbia University Press, pp. 114-138.

WEEKS 3-4: Laws

Essential Reading:

Ayer, A.J. (1956) 'What Is a Law of Nature?', in *Curd and Cover*, pp. 808-825.

Bird, A. (1998) *Philosophy of Science*, ch.1, pp. 25-54.

Dretske, F. (1977) 'Laws of Nature', in *Curd and Cover*, pp. 826-845.

Further Reading:

Armstrong, D.M. (1983) *What is a Law of Nature?*, Cambridge: Cambridge University Press.

Cartwright, N. (1980) 'Do the Laws of Physics State the Facts?', in *Curd and Cover*, pp. 865-877.

Mellor, D.H. (1980) 'Necessities and Universals in Natural Laws', in *Curd and Cover*, pp. 846-864.

Van Fraassen, B. C. (1989) *Laws and Symmetry*, Oxford: Clarendon Press.

WEEKS 5 & 7: Scientific Explanation

Essential Reading:

Bird, A. (1998) *Philosophy of Science*, ch.2, pp. 61-85.

Hempel, C.G. (1962) 'Two Basic Types of Scientific Explanation' in *Curd and Cover*, pp. 685-694.

Hempel, C.G. (1965) 'The Thesis of Structural Identity', in *Curd and Cover*, pp. 695-705.

Further Reading:

Kitcher, P. (1981) 'Explanatory Unification', *Philosophy of Science* 48: 507-31.

Rubin, D.H. (1994) *Explanation*, Oxford: Oxford University Press.

Salmon, W. (1984) *Scientific Explanation and the Causal Structure of the World*, Princeton, NJ: Princeton University Press.

Van Fraassen, B. (1980) *The Scientific Image*, Oxford: Oxford University Press.

WEEK 6: No Lecture

WEEK 8: Inference to the Best Explanation

Essential Reading:

Bird, A. (1998) *Philosophy of Science*, ch.2, pp. 85-94.

Lipton, P. (1991) *Inference to the Best Explanation*, ch.4, London: Routledge.

Further Reading:

Harman, G.H. (1965) 'The inference to the best explanation', *Philosophical Review* 74 (1): 88–95.

Psillos, S. (1996) 'On Van Fraassen's Critique of Abductive Reasoning', *The Philosophical Quarterly*, vol. 46, no. 182: 31–47.

Ladyman, J. et al. (1997) 'A Defence of Van Fraassen's Critique of Abductive Inference: Reply to Psillos', *The Philosophical Quarterly*, vol. 47, no. 188: 305–321.

Van Fraassen, B. (1989) *Laws and Symmetry*, ch.6, Oxford: Clarendon Press.

WEEKS 9-10: Scientific Revolutions

Essential Reading:

Bird, A. (1998) *Philosophy of Science*, ch.8, pp. 275-285.

Laudan, L. (1981) 'A Confutation of Convergent Realism', in Curd and Cover, pp. 1114-1135

Psillos, S. (1999) *Scientific Realism: How Science Tracks Truth*, ch.5, London: Routledge.

Further Reading:

Bird, A. (2001) *Thomas Kuhn*, Chesham: Acumen.

Hacking, I. (1982) 'Experimentation and Scientific Realism', in Curd and Cover, pp. 1153-1168

Kuhn, T. (1962) 'The Nature and Necessity of Scientific Revolutions', in Curd and Cover, pp. 86-101.

Lakatos, I. (1970) 'Falsificationism and the Methodology of Scientific Research Programmes', in I. Lakatos and A.E. Musgrave (eds.) *Criticism and the Growth of Knowledge*, Cambridge: Cambridge University Press.

Worrall, J. (1989) 'Structural Realism: The Best of Both Worlds?' in Papineau, D. (ed.) *The Philosophy of Science*, Oxford: Oxford University Press, 1996.

WEEK 11: The Import of History of Science for Philosophy of Science

Essential Reading:

Votsis, I. (preprint) 'What the History of Science Cannot Teach Us'

Further Reading:

Chang, H. (2003) 'Preservative Realism and Its Discontents: Revisiting Caloric', *Philosophy of Science*, vol. 70(5): 902-912.

Psillos, S. (1994) 'A Philosophical Study of the Transition from the Caloric Theory of Heat to Thermodynamics: Resisting the Pessimistic Meta-Induction', *Studies in the History and Philosophy of Science*, vol. 25: 159-190.

WEEK 12: No Lecture