

HIGH LEVEL SCIENCES READING GUIDE

- Sep 8 What makes the high level sciences special?
- Sep 15 Special science laws and regularities
- ▷ Cohen, J. and C. Callender, "A better best system account of lawhood"
 - ▷ Strevens, M., "Physically contingent laws and counterfactual support"
 - Two ways of thinking about "lawlikeness" in the high level sciences. Cohen and Callender take the traditional path of providing a definition of what it is to be a "high level law". Strevens rather focuses on the question of what high level regularities are liable to offer counterfactual support, and why.
- Sep 22 Explanation, causality, mechanism
- ▷ Strevens, M., "Scientific explanation"
 - ▷ Strevens, M., "The causal and unification accounts of explanation unified - causally"
 - We are discussing explanation not so much for its own sake, but to explore notions of causality and "mechanism" that will be useful for thinking about special science regularities and laws. The first Strevens piece is an encyclopedia article which will give you some background (read only if necessary). It would be right and proper to include also an overview of the different ways of thinking about causality in science, but that is not practical - it's a seminar in itself. So we will look at one approach to causality in particular.
- Sep 29 "Ceteris paribus" in the special sciences
- ▷ Lange, M., "Who's afraid of ceteris paribus laws? or: How I learned to stop worrying and love them"
 - ▷ Strevens, M., "Ceteris paribus hedges: Causal voodoo that works"
 - There are many approaches to understanding the significance of *ceteris paribus* in the special sciences. Lange combines two in one of the more interesting papers on the topic. Strevens offers a different account that turns on the notion of a causal mechanism developed in his work on explanation (previous class).

Oct 6 Basing patterns and explanation

- ▷ Waters, C. K., "Causal regularities in the biological world of contingent distributions"
- ▷ Strevens, M., *Depth: An Account of Scientific Explanation*, SS7.1–7.3
 - Waters discusses the question of the significance and pervasiveness of contingent regularities in biology. We are more interested in the question than on Waters' particular answer. Strevens focuses specifically on the *explanatory* significance of contingencies, and proposes that a particular kind of contingent regularity – one with a limited modal dimension – is especially important. He calls such a regularity a *basing pattern*.

Oct 13 Basing patterns and reduction

- ▷ Fazekas, P., "Reconsidering the role of bridge laws in inter-theoretical relations"
- ▷ Strevens, M., "The explanatory role of irreducible properties"
 - The Fazekas paper is useful as an overview of work on "bridge laws", the principles that are supposed to supply the link between higher and lower predicates/properties in interlevel explanation and reduction. Strevens proposes that basing patterns (introduced in the previous class) in many cases supply the necessary link, without the need for the necessary and/or sufficient relations often thought to be required for such bridging work.

Oct 20 Multiple realizability and functionalism

- ▷ Fodor, J. A., "Special sciences"
- ▷ Block, N., "Anti-reductionism slaps back"
 - Traditional "philosophy of the high level sciences" has, because of its roots in the philosophy of mind, been greatly concerned with multiple realizability. Not just mental states, but properties important in economics, biology, and so on seem to be realizable by physically quite diverse states. Perhaps this is because the properties have a "functional" nature. Fodor's classic paper argues that the multiple realizability of a high level science's kinds does not impugn the science's respectability. Block wonders how a science of functionalized properties could be informative.

Oct 27 Multiple realizability, functionalism, and explanation

- ▷ Jackson, F. and P. Pettit, "Program explanation: A general perspective"
- ▷ Strevens, M., *Depth: An Account of Scientific Explanation*, SS5.3, 5.4
 - Two different ways to think about the explanatory role of multiply realizable properties. Strevens (for once) takes a more pragmatic or deflationary approach.

Nov 3 Multiple realizability, functionalism, and reduction

- ▷ Kim, J., "Reduction and reductive explanation: Is one possible without the other?"
- Now turning to the question of reduction, but without letting go of the intertwined question of explanation. The Fazekas paper on bridge laws is also relevant here (as is the Strevens paper on reduction).

Nov 10 Idealization

- ▷ Cartwright, N., "Truth doesn't explain much"
- ▷ Strevens, M., "Why explanations lie: Idealization in explanation"
- Two ways to explain the fact that science uses models that are "idealized" – that is, simplified in ways that make them appear to misrepresent reality. Note that Cartwright will be giving the Frumkes lecture at NYU in the week following this class.

Nov 17 Special probability

- ▷ Loewer, B., "Determinism and chance"
- ▷ Strevens, M., "Deterministic probability"
- How to understand probability in statistical mechanics, evolutionary biology, economics? Are such probabilities completely independent of "fundamental, irreducible" probabilities of the sort (apparently) found in quantum mechanics? If so, what makes them probabilistic at all?

Nov 24 Causal discovery

- ▷ Reading TBD

Dec 1 Why is there anything but physics?

- ▷ Loewer, B., "Why is there anything except physics?"
- ▷ Loewer, B., "Why there is anything except physics"
- ▷ Strevens, M., "How are the sciences of complex systems possible?", SS1-4

Dec 8 Why does counterfactual support matter? (And other questions . . .)

- The question about counterfactual support is something I've always wanted to think more about . . .