

Dispositions and Causal Powers

HPS 2621

Friday 9:30 - 12:00 CL G-28

Students can choose to write either a term paper (15-20 pages) or two shorter papers (6-10 pages) on the topics we are covering. In addition students are required to write a *very short* paper (up to, but not more than 2-pages) each week on the readings. It can be a "review" of the article(s), a discussion of what you think is an interesting or wrong argument, a problematic or supportive example of the ideas in the article, etc.

All the readings will be available in the HPS Department - 1017 CL - next to the copying machine. You can Xerox them there (please do not take them out of office).

August 31 - Introduction
McGuire, Mitchell, Bogen

Sept 7 - Boyle's articulation of the "New Science" introduces many of the "key" issues concerning dispositions, particularly those centering on distinctions between fundamental and derivative properties and their explanatory roles.

Readings: Robert Boyle: "Origin of Forms and Qualities" pp. 13-41 in *Selected Philosophical papers of Robert Boyle*
 "About the Excellency and Grounds of the Mechanical Hypothesis"
 ed. M.A.Stewart.

McGuire

Sept 14 - Locke expounds a 'metaphysical' distinction between properties that are fundamental, irreducible, and 'in' bodies and particles, and those which are derivative, 'imputed,' and secondary, and are nothing but 'powers' ascribable to bodies as they stand in relation to us. Here we have a classic discussion of a version of the categorical/non-categorical distinction

Readings: John Locke: *An Essay Concerning Human Understanding* Book II, Chapter viii; Book III, Chapter iii..
 Secondary reading for Boyle and Locke: "Newtonian Forces and Lockean Powers" Peter Heiman and J.E. McGuire

McGuire

Sept 21 - Dispositions are sometimes intended to do explanatory work. Darwinian evolutionary biology had long been charged with embracing as its major tenet the "tautology" encoded in the phrase "the survival of the fittest". It has been proposed that by construing "fitness" as a propensity or disposition, the tautology vanishes and explanatory correctness is restored. But what kind of property is "fitness".

Readings: Mills, S. and J. Beatty. 1979. "The propensity interpretation of Fitness" *Philosophy of Science* 46:263-286. Reprinted in *Conceptual Issues in Evolutionary Biology*. E. Sober, ed. Cambridge: MIT Press. 1994.

Sober, E. excerpts from *The Nature of Selection* Bradford/MIT Press, 1984; 2nd edition, University of Chicago Press, 1993.

Mitchell

Sept 28 - Some philosophers have defended the distinction between dispositional and categorical properties and have further argued that dispositions are "real" insofar as they are grounded in (or supervene on) a categorical or causal base.

Readings: Fisk, "Capacities and Natures" reprinted in *Dispositions*, ed. By Tuomela pp.189-210.
 Prior, Pargetter and Jackson "Three Theses About Dispositions." *American-Philosophical-Quarterly*. 1982; 19,251-258.
 Mckittrich "The Bare Metaphysical Possibility of Bare Dispositions", mss.

Mitchell

Oct 5- Are appeals to dispositions indispensable to causal explanations?

Readings: Mellor "In Defense of Dispositions" says Yes: In order to understand how water dissolves sugar, you must consider solubility-sugar's disposition to dissolve in water. (Tuomela pp. 55-76)
 Mackie "Dispositions, Grounds, and Causes" says No: the sugar is soluble because it has non-dispositional properties (molecular structure, etc.) which account for its dissolving in water, and these can be understood without appeal to dispositions.(Tuomela pp.99-108)
 Alston snippet (§5 of "Dispositions, Occurrence, and Ontology"): To have a disposition is to be in a state individuated by causal factors which produce the behaviors which manifest the disposition.(Tuomela p.370-376)

Bogen

Oct 12 - Can you be a good empiricist without reducing dispositions to counterfactuals or laws which support counterfactuals?

Readings: Ryle: "Dispositions and Occurrences": If you think dispositions don't reduce to laws, you're an anti-behaviorist, myth eaten, ghost in the machine symp. (Tuomela pp.339-358)
 Goodman "Counterfactuals and Dispositions": The prospect of reducing dispositions to counterfactuals is so dim that you'd better be able to accommodate them to empiricism some other way. But the accommodation won't be pretty.(Tuomela pp.1726) -

Bogen

Oct 19 - Newton puts forth an extraordinary account of the periodicity of light and double refraction in Iceland crystal that involves attributing 'primordial' and 'natural dispositions' to the 'structure' of light, a position which accords with the fact that he holds a force-ontology. What is of high interest is that the 'structure' of the particulate matter that makes up individual rays of light is merely a carrier of the 'dispositions' or 'sides' of the light particles, and of itself is no part of the explanation of the periodicity of the phenomena in question. Newton makes a similar move (i.e. that the explanatory properties of light are intrinsic to its nature) in explaining the action of refraction and reflection. His ontology is far more than a simple, intrinsically non-active atomism, and it raises pertinent questions for the seminar.

Readings: *Opticks* Book II, Part III, props XII--XIX: Query 25. pp. 354-365.
 Secondary readings: *Theories of Light from Descartes to Newton*. A. I. Sabra, Chapter 8, pp. 221-230: Chapter 13, pp. 331-342.

McGuire

Oct 26 - Causal Powers, forces and action.

Readings: Leibniz, Aristotle
 "Newtonian Forces and Lockean Powers" Peter Heiman and J.E. McGuire
 "Forces, Powers, Ethers and Fields" McGuire

McGuire

Nov 2 - Causal Powers - Science doesn't need laws - but something else.

Readings: Harre, , Mumford, McMullin
McGuire

Nov 9 - Laws and dispositions. What are some options for correcting the 'laws problem'?

Readings: Cartwright, excerpts from *How the Laws of Physics Lie*
 Huttemann, "Laws and Dispositions" *Philosophy of Science* 1998:
 65(1), 121-135.
 Mitchell "Dimensions of Scientific Law", *Philosophy of Science* 2000.

Mitchell

Nov 16 - Laws, Counterfactual regularities, and Mechanisms

Readings (tentative and subject to change):

Machamer, Darden, Craver "Thinking About Mechanisms": Causal explanation is often a matter of describing the parts of a system of causal factors, and describing the activities by which they produce the effect of interest. If the mechanism operates regularly enough, we will be able to write down generalizations of the kinds Mitchell calls laws. The generalizations tell us how to use what we know about the mechanism to explain further instances of the same, or related effects. But not all mechanisms are regular enough to support such generalizations. (Phil Sci 2000)

Woodward PSA 2000: Causal explanations depend upon counterfactual regularities among ideal manipulations of a causal factor and changes in items which that factor influences. (preprint or draft version)

Bogen snippet on why counterfactuals are the last refuge of scoundrels. (from London talk)

Bogen

Nov 23 (Thanksgiving) *Holiday*

Nov 30 Dispositions, Propensities and Probabilities

Readings: (possibly) Mellor, Humphreys, Sklar

Dec 7 Dispositions and Quantum Mechanics

Readings: (possibly) Krips

Dec 14 Remaining issues, food, drink etc.