

Ph.D. Abstract – On the Disunity of the Sciences

This thesis examines the claim that the sciences are disunified. **Chapter 1** outlines and introduces different accounts of the stratification of the sciences in the literature, in particular, *Unificationism*, *Disunificationism*, *Eliminativism* and *Human Science Disunificationism*. I argue that all of these competing views are informed by an ideal model for successful science. In particular, all of the views discussed are committed to the claim that a science requires laws to be considered scientifically legitimate. At the end of this chapter, the narrower topic of the thesis is revealed: do the special sciences have real legitimate *ceteris paribus* laws?

In **Chapter 2**, I examine Fodor's (1974) disunity of the sciences hypothesis, which introduces a distinction between the physical sciences like physics and the special sciences such as geology, biology, psychology and the various medical sciences. These later special sciences are considered 'special' in so far as they cannot be straightforwardly reduced to physics. In this chapter, I claim that Fodor's account requires a more precise analysis of the relationship between the laws and the natural kinds of the special sciences. I claim that if Fodor is to save the special sciences from reductionism, then the burden of proof lies with him to provide an account of *ceteris paribus* laws in the special sciences. Therefore, *Special Science Realism* is reliant on an account of *ceteris paribus* laws.

Chapter 3 assesses the semantic challenge to *ceteris paribus* laws; namely that we cannot provide a non-vacuous account of their semantics. I argue that any attempt to provide the truth conditions by hedging *cp* laws (e.g. Fodor (1991) & Pietroski and Rey (1995)) faces a dilemma: either it is not "*cp* laws all the way down" and *cp* laws are placeholders for the real laws of physics, or it is "*cp* laws all the way down" and all laws are vacuous. I analyse a weaker semantic account (Lange (1993)), but I reveal that this leads to a problem for testing *cp* laws. Consequently, *cp* laws are faced with a pejorative dilemma which combines their *semantic* and *epistemic* problems: either *cp* laws can be completed prior to testing, but only either in a vacuous way or in such a way that they are made placeholders for the real laws of physics or *cp* laws can be completed within testing, but consequently, the authenticity of the scientific investigation cannot be preserved.

Chapter 4 argues that it would be premature, given the semantic problems of the last chapter to argue that there are no *ceteris paribus* laws. There is a further metaphysical question, which needs to be addressed concerning whether there are truthmakers for *cp* laws. I argue that both of the *contingentist* accounts of laws of nature (i.e. the *regularity* theory (Mill (1846), Ramsey (1929), Lewis (1973) and the *nomic necessitation* view (Dretske (1977), Tooley (1977), Armstrong (1968)) cannot save *cp* laws from vacuity. However, I examine the view that dispositions are the truthmakers for *cp* laws (Lipton (1991), (Bird (1998)). I argue that an analysis of the relationship between dispositions and laws reveals that a less stringent account is required, if our theoretical account is to be made to fit with scientific practice. I argue for an *a posteriori* account of dispositions, which significantly effects how we construe the relationship between dispositions and their corresponding laws, which I call *Variant Dispositionalism*. The dispositional account of *cp* laws is rejected in favour of a looser account of *cp* generalisations.

In **Chapter 5**, I argue that the latter *semantic*, *epistemic* and *metaphysical* problems that face *cp* laws may be the result of an equivocation of importantly different kinds of *cp* laws. I propose the *heterogeneity* problem for *cp* generalisations which claims that candidates for *cp* laws function in very different ways in different disciplines. The difficulty is that all of these generalisations are given a single analysis *qua cp* laws. I

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make a distinction between *idealized and contextual cp laws*. The *cp* clause in an idealised *cp* law plays the role of indicating that the relationship described in the law is an idealization. The *cp* clause in a contextual *cp* law is standing in for the context; the absence, presence or constancy of which may contravene the law. Moreover, I claim that the laws of physics and the laws of the special sciences are distinct: *cp* laws in physics are idealized *cp* laws whereas the laws of the special sciences are contextual *cp* laws. The upshot is that although we might claim that it is “*cp* all the way down” (Cartwright (1989)) this does not entail that all sciences are made equally. The disunification of the special sciences is supported by my argument that the laws of the special sciences have an entirely different methodology to the laws of physics.