

Epistemic and Methodological Differences between Historical Science and Experimental Science

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Abstract

It is sometimes held that there is a single uniform method for all of science and that experimental science provides the prototype. In its classical form, experimental science stresses the testing of hypotheses via successful and failed predictions in controlled laboratory settings. But many scientific hypotheses cannot be "tested" in this fashion. Historical hypotheses, which are common in archaeology, geology, biology, planetary science, astronomy, and astrophysics, provide salient examples. Insofar as hypotheses about the remote past cannot be tested in controlled laboratory settings, historical research in the natural sciences (my focus) is sometimes said to be inferior to experimental research. Drawing upon examples from diverse fields of historical, natural science, I sketch an account of the structure and justification of "prototypical" historical natural science that distinguishes it from "classical" experimental science. I argue that the confirmation and disconfirmation of historical hypotheses depends primarily upon the explanatory (vs. predictive or retrodictive) success or failure of hypotheses vis-à-vis empirical evidence discovered through field studies. The account of historical explanation that I develop is a version of common cause explanation. I argue that the principle of the common cause is neither purely methodological nor strictly metaphysical. It is grounded upon a physically pervasive, time asymmetry of causation (aka the asymmetry of overdetermination).