
Modalities and Counterfactuals in the Historical Sciences

Lucas Escobar*¹

¹République des Savoirs - ENS - PSL – Ecole Normale Supérieure de Paris - ENS Paris, Université de recherche Paris Sciences Lettres (PSL), CNRS – France

Abstract

Our knowledge of the past is indirect knowledge, it is evidence-based. In order to access past situations and fill in the gaps of history (traces tend to diminish over time (Cleland & Wilson, 2024)), scientists are engaged in modal reasoning. This is the thesis we defend. To determine what was the case, scientists in the historical sciences (history, archaeology, historical linguistics, evolutionary biology, paleoecology, etc.), formulate multiple hypotheses that represent different possible explanations for the traces observed. A hypothesis is accepted if it is both possible and plausible, and if competing hypotheses have been ruled out. This general framework accommodates different epistemological approaches, whether abductive, such as the inference to the best explanation defended by Cleland (2002, 2011), Bayesian, as proposed by Tucker (2004), or pluralistic and multi-methodological, as argued by Currie (2018).

Although the importance of modalities in understanding the past is widely recognized, their definition remains difficult. Even when scientists and epistemologists explicitly engage with modalities, they remain loosely defined. When confronted with an event (whether human, geological, climatic, etc.), they question its necessity or contingency, and their response depends on their often implicit conceptions of the nature of history—whether necessitarian, deterministic, indeterministic, stochastic, etc. When faced with a property (for example, in biology, the fact that a species has wings), they examine the conditions for the emergence of a new possibility, the development of new properties, or the dispositions of an individual. We lack a general theory of modalities for the historical sciences.

However, we can identify four major tendencies in the historical sciences concerning the notions of possibility and necessity, which could lead to a redefinition. The first is the resurgence of these notions through the development of counterfactual approaches. Counterfactuals are actively discussed in the epistemology of historical sciences, though they remain controversial. Indeed, two key questions arise: why should scientists be interested in what is non-actual? And how can we determine whether a counterfactual proposition is true or false? Even in epistemological frameworks that accept counterfactuals (Deluermoz & Singaravelou, 2016), modalities remain undefined, as these approaches neither adopt the semantics of counterfactuals nor the various associated metaphysical theories. The notion of possible worlds, in particular, is often rejected as being too metaphysical and insufficiently scientific.

The second approach, developed by Ben-Menahem (1997; 2008) (inspired by S.J.Gould), is the most prevalent in the epistemology of the historical sciences. It explicitly seeks to

*Speaker

avoid the notion of possible worlds by analyzing modalities through stochastic systems. The contingency or necessity of an event is defined gradually, depending on its sensitivity to initial conditions and disruptive events. Counterfactuals are interpreted as the reconstruction of a situation in which a parameter of the initial conditions is altered. This approach appears unsatisfactory to us. In attempting to do without *possibilia*, this theory fails to explain how we can conceive of initial conditions other than those that actually occurred. Furthermore, it does not fully account for the epistemology of the historical sciences, as it envisions historical scenarios by moving from initial conditions to process outcomes (using indicative conditionals), whereas scientists typically work in the opposite direction, starting from observed outcomes and reasoning backward to past situations (using counterfactuals).

The third approach explores modalities through narratives and can be divided into two tendencies. The first (Beatty & Carrera, 2011) considers narration as the construction of an alternative scenario which, if accepted as plausible, supports the claim that the actual course of history was contingent. The second focuses on analyzing modal terms embedded in scientific narratives to reveal the modal dimension of historical knowledge (Swain, 2021). However, these approaches fail to fully account for either the epistemology or the metaphysics of the historical sciences.

Finally, some theorists have sought to grant epistemological status to the notion of possibility by asking what constitutes a biological possibility. The central question here is: how can something new emerge? (Montévil, 2019). The notion of constraint plays a key role in this framework, as it determines what can or cannot arise at a given moment. However, this approach does not provide a general definition of modalities.

Our contribution will be to show that by analyzing the role of counterfactuals in knowledge of the past, we can define modalities through possible world theory. This approach allows us to critique other proposed analyses and, in some cases, integrate them—particularly narrative analyses and constraint-based analyses (by interpreting constraints as spheres of accessibility). The main challenge of our approach, which we will address, concerns backtracking counterfactuals (those conditionals in which the consequent is temporally located before the antecedent). The historical sciences, in studying the past, assert that a past event occurred based on present observables (traces). This implicitly challenges what Lewis (1979) describes as the asymmetry of counterfactual dependence: the future depends on the present and remains open to possibilities, while the past is independent of the present and therefore closed (Currie, 2018). We will argue that knowledge of the past constitutes a specific context in which backtracking counterfactuals are accepted.

Beatty, J. & Carrera, I. (2011). When What Had to Happen Was Not Bound to Happen: History, Chance, Narrative, Evolution. *Journal of the Philosophy of History* 5 (3):471-495.

Cleland, C. E. (2002). Methodological and Epistemic Differences Between Historical Science and Experimental Science. *Philosophy of Science*, 69(3), 447-451.

Cleland, C. E. (2011). Prediction and Explanation in Historical Natural Science. *British Journal for the Philosophy of Science*, 62(3), 551-582.

Cleland, C. E. & Wilson, J. (2024). Time in Historical Science in Time in Science, CNRS

Currie, A. (2018). *Rock, Bone, and Ruin: An Optimist's Guide to the Historical Sciences*. MIT Press.

Lewis, David (1979). Counterfactual Dependence and Time's Arrow. *Noûs* 13 (4):455-476.

Montévil, Maël. (2019). Possibility spaces and the notion of novelty: from music to biology. *Synthese*.

Swain, Daniel G. (2021). What is narrative possibility? *Studies in History and Philoso-*

phy of Science 89 (C):257-266.

Tucker, A. (2004). *Our Knowledge of the Past: A Philosophy of Historiography*. Cambridge University Press.

Keywords: historical sciences, possible worlds semantics, causality, counterfactuals