

Section D.3 Philosophical questions raised by the history and sociology of science
WHAT THE HISTORY OF SCIENCE CANNOT TEACH US

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This paper aims to show that the history of science has only a very minor role to play in the scientific realism debate. The first part of the paper starts with a brief exposition of how the history of science has come to play a prominent role in the debate. The turning point came in the sixties when Thomas Kuhn and others undermined the orthodox positivist tradition by showing that a careful study of the historical record speaks against the linear accumulation of scientific knowledge. But, as is so often the case, reaction to the admittedly naïve positivist view was disproportionate and resulted in an equally naïve and diametrically opposite view, viz. that there is no significant accumulation whatsoever. Realist philosophers like Hilary Putnam, Richard Boyd and W.H. Newton-Smith were quick to reply that successful theories preserve theoretical components and central theoretical terms of earlier successful theories. This attempt to rescue realism did not last long, for in the early eighties a more sophisticated anti-realist argument appeared. Larry Laudan's pessimistic meta-induction argument is now widely considered to be the main obstacle for realism. In short, the argument holds that since past predictively successful scientific theories and their central theoretical terms have eventually been discarded, we have inductive evidence that our current theories will also be discarded one day. Laudan's landmark attack has precipitated a realist strategy (see, for example, Philip Kitcher, Stathis Psillos and John Worrall) that is primarily concerned with the interpretation of the historical record. The strategy is now the mainstream approach for scientific realists.

The second part of the paper aims to show that the realists have mistakenly directed all their efforts to the history of science. Though anti-realist historical arguments must be answered, the expected returns from a realist-friendly interpretation of the history of science are overestimated. This is easily illustrated when one considers that the preservation of a theoretical component through theory change is neither a *necessary* nor a *sufficient* condition for its truth or approximate truth. It is *not a necessary condition* because even though a component may be true/approximately true its preservation is at least sometimes a matter of contingency. It is *not a sufficient condition* because the mere survival of a given theoretical component does not guarantee that it has latched onto the world. A variety of reasons may be responsible for a component's survival. For example, it may be a convenient feature of scientific practice or it may be a useful tool that has no power of representation.

The upshot of this paper is that the most telling, but admittedly not conclusive, test for which components have latched onto the world is whether they are, at the time, indispensable in the making of predictions. This test can be applied independently of any historical considerations and therefore makes the requirement that a component be preserved through theory change virtually superfluous. Thus, my advice to the realists is to focus more on elaborating such prediction-based tests. The conclusion is not to completely dismiss the importance of history. Preservation through theory change is a non-negligible indicator of truth/approximate truth despite being neither a necessary nor a sufficient condition for it.