



McGill  
University

Foundations & Philosophy of Science Unit

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Professor Larry Laudan

Dear Larry

Thank you for yours of October 25th.

As I understand your sentence concerning my theory of partial truth, it does not satisfy you because it does not allow one to infer, from the success of a scientific theory, whether the entities it postulates in fact exist. (You made a slip of the typewriter when writing 'truth or truth-likeness of all the entities postulated by the theory': entities cannot be truth or false.)

That is correct. But a general theory of truth is a part of semantics and that cannot possibly be its function. So far as I can see there is only one way of ascertaining (though not with certainty) whether the entities referred to by a theory do exist, namely to test the theory for consistency with both a set of relevant data and a set of adjoining theories. The philosopher is in no position to fashion a special recipe for warranting that the theory is true, and the scientist can at most infer that the theory is likely to be true--until new notice.

Take the case of electromagnetic theories, or rather theories of electromagnetism. As long as it was a question of accounting for electrostatic and magnetostatic facts, for the interaction among currents, and induction, the field theories and the action at a distance theories gave roughly the same results (predictions). In other words, before Hertz' experiments on electromagnetic waves one could adopt a conventionalist attitude and say that the field hypothesis, inherent in the Faraday-Maxwell theory, was just a convenient fiction introduced to connect observable facts. The discovery of e.m. waves changed all that, because such waves could not possibly be predicted by action at a distance theories. An e.m. wave has an autonomous existence once produced by an antenna, and such existence is postulated by field theories alone. So, physicists concluded, rightly, that the field is not just a gimmick for systematizing data but a real entity. Mercifully, conventionalist philosophers were impotent to block this process.

What the philosopher can and must do is to help the scientist to disclose the genuine referents of scientific theories. (The matter of the real existence of such referents must be left in the hands of the scientists.) Thus the philosopher of physics may help analyze quantum mechanics and show that this theory concerns (is about) microentities in general, not about observers--and this simply because the theory contains no axioms describing the behavior of observers. But putative referents are not the same as existents.

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The theory may be wrong in hypothesizing the real existence of some of its referents. But in any case the philosopher can help in this case provided he is a realist and cares for the very concept of reference--which is totally absent from the semantics of non-realist philosophers, in particular positivists. So far as I know the only theory (hypothetical-deductive system) of reference, and in particular factual reference, is contained in Ch. 2 of my Sense and Reference (Reidel 1974).

To summarize. In order to find out whether the entities referred to by a theory in fact exist, we must first ascertain which entities are in fact described by the theory (sometimes an arduous job), then put the theory to multiple tests, not only empirical but also conceptual--as described in the last chapter of my Scientific Research, vol. 2 (Springer, 1967). Even so it may eventually turn out that some entities postulated by some successful theories do not exist after all.

That is how I see your problem.

C ordially



Mario Bunge

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