SECTION 6: PHILOSOPHY OF SCIENCE

Kuhn Loss: A Dilemma

Dr. Ioannis Votsis
Philosophisches Institut, University of Duesseldorf
votsis@phil-fak.uni-duesseldorf.de

Kuhn-loss – the term seems to have been coined by Heinz Post (1971, 229) – is a paradigm's or theory's loss of its predecessor's ability to offer explanations in a certain puzzle-solving domain (e.g. Paul Hoyningen-Huene 1993). At first glance the presence of Kuhn loss seems to undermine the claim that scientific knowledge is cumulative, i.e. the claim that successor theories preserve all of their predecessor's successes. In this talk, I present anti-realist advocates of Kuhn loss with an unattractive dilemma: Either Kuhn loss has historical instantiations but is innocuous to the epistemic commitments of the scientific realist or it is a real threat but has no historical instantiations.

As defined above, Kuhn loss does not demand that the lost explanations enjoy genuine empirical success. Indeed, that is precisely how most of its proponents have used the notion. Take Hoyningen-Huene's (1993, 261) example that Newtonians lost the Cartesian ability to explain gravitation. The Cartesian 'explanation', to wit that planets are kept in orbit by fluid vortices, made no empirically confirmed predictions whatsoever. Or take Steve Fuller's (2000, 67) example that the Newtonian paradigm lost the Aristotelian ability to explain biological and psychological phenomena. One can hardly maintain that his hylomorphic 'explanations' were empirically successful. Realists need explanations, but not those lacking empirical merit. Thus, although the two examples qualify as Kuhn losses, as previously defined, they are not the kind of losses that could challenge the realist claim that scientific knowledge is cumulative.

One way around this objection is to modify the notion of Kuhn loss so as to demand real empirical success from the lost abilities. Finding examples that potentially satisfy this stronger formulation is not easy. Hans Radder's (1996, 63) example of Poiseuille's law is the only one I have been able to unearth. The law is certainly predictively and explanatorily successful. Crucially, claims Radder, it cannot be reproduced from quantum mechanical accounts of fluids. It thus seems to be a bona fide case of Kuhn loss in the stronger sense.

Fortunately for the realist, Poiseuille's law was never lost. It is in use today and can be found in numerous scientific textbooks. Having said this, Poiseuille's law presents another problem for the realist. It has been customary to require that successful parts of old paradigms or theories be preserved (via the correspondence theorem) in new paradigms or theories (see Post 1971). Poiseuille's law is preserved but independently of any new paradigm or theory. What does this entail for the realist? New paradigms or theories need not replace old ones *in toto*. That is, they need not range over all the old domains of phenomena. In this sense, our use of designations like '*the* successor' is hyperbolic. A case in point is the existence of two successors to the Newtonian paradigm, i.e. relativity theory and quantum mechanics. Indeed, as Poiseuille's law reveals, neither of the two successors can account for all Netwonian domains of phenomena. Some realists will no doubt argue that Poiseuille's law will eventually be derived from quantum mechanics once the right auxiliary hypotheses become available. Bar that prospect, I want to maintain that there is nothing dire about the independent survival of a predictively and explanatorily successful law because nothing in realism clashes with the partial replacement of old paradigms or theories by new ones.

References:

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