

What role can history of science play in philosophy of science ? : in the case of theories of theory change in geoscience

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In Donovan et al.(1988) and its preliminary paper (1986), Laudan and his co-authors pointed out problems of "historical approach" in philosophy of science, which sees history of science as the source and judge of philosophical claims about science (e.g. the works of Kuhn, Feyerabend, Lakatos and Laudan). Laudan and his co-authors attempted to test such theories of theory change in science in more precise ways.

The purpose of our presentation is to examine Laudan's criticism, and consider what is required and how to study history of science to develop philosophy of geoscience (in particular, theory change in geoscience). Laudan et al.(1986: 1988) pointed out the following problems of existing historical approach:

A. A lack of comparative research : Authors of historical approach have failed to compare the ability of rival models to explain the case under investigation. That is, it is rare for such an author to compare how well his model and its rivals fit the same case.

B. Illustrative than probative : Authors of historical approach have used historical examples to back up their theoretical claims. However, these examples often appear to play illustrative roles than probative ones. Many of case studies are not tests of the theory in question at all - rather, they are applications of the theory to a particular case.

C. A problem of a global comparison : In their case studies authors of historical approach have sought to compare their whole theory of scientific change with the case in question. However, since it is hard to know which part of the theory is wrong, such global comparison is unsatisfactory.

For our aim of developing the philosophy of geoscience, the following are needed.

1. Comparative research : We need to specify our theory to be comparable with other rival theories.

2. Local comparison : We need to break down the claims involved in our theory and formulate them as precisely as possible, to test them individually.

3. The history of geoscience ,especially the history that earth sciences and planetary sciences converged to form geoscience, which is a loosely-structured discipline.

From examination of Laudan's criticisms, it can be said that 1 and 2 are needed. And since the history of geoscience has not been studied so much so far, 3 is needed.

The slogan of our research is this. "Philosophy of science without history of science is empty; history of science without philosophy of science is blind" (a parody of Kant's famous dictum by N. R. Hanson (1962)). The second purpose of our presentation is to invite historians of geoscience to produce the philosophy of geoscience.

References

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