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PRECEPT AND PRACTICE IN SCIENCE

An Examination of Some Objections to Theories of Scientific Method

by

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A thesis submitted for the Degree of Doctor of Philosophy in Philosophy

University of Auckland

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ABSTRACT

One of the traditional aims of the philosophy of science has been to formulate a methodology of science—that is, a normative theory of scientific method. The rules and standards of such a theory are intended to capture the central features of scientific rationality and to explain the sense in which scientific knowledge progressively grows. Although no particular methodology of science has won universal endorsement, it is generally agreed among philosophers that the broad aim of constructing one is both reasonable and worth pursuing in order to understand the nature of scientific growth. But this aim has also been attacked as fundamentally misconceived by some critics who maintain that no theory of method can do justice to actual science.

The objections to the philosophical program of framing a methodology of science come mainly from three quarters. Firstly, there is Paul Feyerabend, according to whom the historical development of science reveals that no set of general normative rules and standards can be given for science. Most of the rules and standards hitherto proposed, he contends, have been violated by scientists and, moreover, were necessarily violated, owing to the incommensurability of revolutionary scientific theories. Secondly, there is Michael Polanyi, who claims that scientific rationality cannot be codified in the explicit rules and standards of any theory of method because much of scientific knowledge and practice is 'tacit' and reflects the personal, unspecifiable contributions of individual scientists. And thirdly, sociologists of scientific knowledge (in particular, those of the Strong Programme) assert that the nature and content of science should be explained in sociological terms rather than by reference to a methodology of science.
However, it is argued here that the objections made by Feyerabend, Polanyi, and the sociologists to the possibility of a theory of method do not stand up to critical examination.

A large part of the anti-methodologists' case is based not only on an overly narrow view of the nature of a theory of method, but also on the mistaken belief that the traditional philosophical and epistemological approach to the investigation of scientific rationality should be replaced by a largely descriptive analysis of scientific practice. This belief is criticised on the grounds that a normative methodology must not be supposed to explain scientific practice, nor can views on the nature of scientific rationality be derived from descriptions of scientific practice.

Finally, it is suggested that the positions of Feyerabend, Polanyi, and the Strong Programme have deep affinities with the 'practice-oriented' philosophy of the later Wittgenstein. This may, perhaps, explain why they abandon realist construals of scientific theories, of scientific standards, and of the notion of truth. Like Wittgenstein, they adopt a form of anti-realism and conventionalism which leads, ultimately, to a relativist interpretation of scientific standards and knowledge. Coupled with the anti-methodologists' failure to defeat the possibility of a theory of method, this relativism demonstrates the poverty of an attack on method constructed on Wittgensteinian lines.
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