

## The Popper-Kuhn Debate on the Nature of Scientific Development

In 1965, three years after the publication of Kuhn's classic, *The structure of scientific revolutions*, Imre Lakatos, a distinguished colleague of Karl Popper, organized a conference aimed at an exchange of ideas between Popper and Kuhn and their respective supporters. The subject was *Criticism and The Growth of Knowledge*. The relevant set of papers was published in 1970.

Initiating the debate, Kuhn observed that although there were several points of agreement between his and Popper's view of science there were three important differences between them. First, the existence and role of normal science; second, the role played by sociological and psychological factors in the development of scientific knowledge, and finally, the manner in which scientific change occurred. In terms of Kuhn's presentation, the development of scientific knowledge is visualized as comprising a 'normal' and a 'revolutionary' phase. In addition to features described in the previous section Kuhn includes, as an important feature of 'normal' science, the lack of criticism of the basic assumptions (which Kuhn later subsumes under the concept 'paradigm') taken as given by a particular scientific community. Popper in his reply accepted that 'normal science' did exist. But he contended that its emergence was based on bad teaching and indoctrination. For Popper, criticism played a central role in the growth of knowledge and its absence in any phase of scientific growth was totally unacceptable. He felt that scientific growth was achieved through problem solving and moving from one set of problems to another entirely different set.

In explicating the second disagreement, Kuhn argued that sociological and psychological factors played an important role in the growth of scientific knowledge, generally mediated through the scientific community. Kuhn describes a scientific community as one which consists of the practitioners of a scientific speciality who share a paradigm and act as the producers and validators

of knowledge. In view of this, Kuhn argued that the essential feature of scientific growth is that it is based more on sociological and psychological factors of research rather than any 'logic of discovery'. Popper, whose view of growth of knowledge was based on the logical refutation of a given scientific conjecture, replied that he found it disappointing that Kuhn had invoked the assistance of sociology and psychology which in his view were spurious sciences and that only logic of discovery could lead to enlightenment concerning the aims of science and its possible progress.

Finally, according to Kuhn the manner in which scientific change occurred was not accessible to any rational or logical explanation. Scientific change was more due to a gestalt switch rather than a smooth transition from one paradigm to another. An important implication of this mode of change is that it is somewhat akin to religious conversion and therefore outside the purview of rational explanation. Similarly when scientists change their allegiance from one paradigm to another they are forced to look at reality through a new pair of spectacles. Again Popper, arguing that while an intellectual revolution may often look like a religious conversion, observed that it did not mean that the new theories could not be evaluated critically and rationally. Popper pointed out that it would be simply false to say that the transition from Newton's theory of gravity to Einstein's is an irrational leap, and that the two are not rationally comparable. Popper concluded by affirming the possibility of rational comparison in science as distinct from theology and stressed that only in science is progress possible.

To sum up, Popper and Kuhn occupy different ends of the debate on the nature and development of scientific knowledge. Their debate gave rise to a new set of controversies whose resolution is yet to be achieved although currently Kuhn's model of scientific change is taken as being closer to the realities of scientific practice and change.

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