

Karl Popper was arguably the greatest philosopher of science of the century; some say, the greatest philosopher of the century. Although he is not the household name he deserves to be, he is not entirely unfamiliar to the *Resonance* readership. He has been frequently cited in the pages of *Resonance*, in Narlikar's series on The Origin of the Universe, in Bondi's statement on the spirit of science, etc.

Sir Karl Raimund Popper was born on 28 July 1902 in the Ober St Velt district of Vienna. His father was a scholarly and distinguished lawyer with radical liberal sympathies. His mother was a talented musician and from her he inherited a love for music. After school, he studied mathematics, physics, psychology, philosophy and music, earning his doctorate in 1928 from the University of Vienna. After qualifying as a secondary school teacher, he taught at a high school until 1937.

During this period, he actively pursued his studies on the nature and theory of knowledge, and his first book, *Logik der Forschung*, was to contain his solutions to some of the fundamental problems of the Theory of Knowledge. The success of this book established Popper's reputation as a philosopher. This book laid down the foundations for his unending crusade for critical rationalism, for unraveling the nature of the scientific enterprise and for defining the scientific method.

So, what is the scientific method, according to Popper? The traditional view, which goes back to Bacon, Galileo and Newton is that observations and experiments come first. By induction, general theories are ground out from these observations and hypotheses are then derived from these. Further experiments are performed to verify these hypotheses. The original theory is thus claimed to have been proved or disproved and the scientist assumes she has arrived at the truth of the matter until proven wrong.

Popper did not like the idea of experiment as a proof of a theory. He believed instead that wherever there was a recognisable problem (the theory did not fit in with the facts), a bold and imaginative theorist will make a risky conjecture (the riskier, the better) and then try hard to design experiments to falsify predictions made from this conjecture; i.e. carry out tests or experiments not to prove the predictions but actually to *refute* them. The refutations will help to modify the original conjecture and lead to a better approximation.

Empirical tests are therefore used to weed out falsehoods (not prove truths!). In fact, Popper believed, the truth could never be conclusively achieved; only closer and closer approximations to the truth are realised. A single counter-example can show a *law* to be false.



The role of experiments in all this is very clear. Popper has argued that "in the history of science, it is always the theory and not the experiment, always the idea and not the observation, which opens the way to new knowledge . . . it is always the experiment which saves us from following the track that leads to nowhere; which helps us out of the rut, and which challenges us to find a new way."

The violent turn of political and social events in Europe triggered off by Hitler's Nazism in Germany forced Popper to move first to Cambridge and then to New Zealand in 1937. He remained there till 1945, teaching philosophy. While there, he wrote a famous argument for democracy, moderation and liberality which also served as a ferocious attack on totalitarianism, titled *The Open Society and its Enemies*. It is a covenant of principles by which a community can ensure its own well being and that of its children.

Popper believed that it is individual human actions, with consequences which are more often unintended than intended, which produce the spontaneous order that we recognise as civilised society. The central point of good rule is not "Who should rule?" but "How can we get rid of bad rulers without bloodshed?" Popper's liberalism is based on utility; his articulation of the principle of utility is governed by the negative formulation, *eliminate suffering* and not *maximise happiness*. His views on social

reform thus mirror his views on nature and science.

He returned to England in 1946, to teach logic and scientific method at the London School of Economics and Political Science till his retirement in 1969. He was decidedly the most important mind to have worked at the School. He was elected a Fellow of the Royal Society in 1976. He passed away, at the age of ninety-two, on 17 September 1994.

Ray Percival in a review in *New Scientist* said that "Apart from Aristotle and Plato, no other thinker can equal the breadth and depth of Popper's contributions to knowledge. Popper's mind grappled with problems ranging from logic and quantum physics to evolutionary, social and political theory. And in a century obsessed with specialisation, breadth is astonishing."

Let me end this piece with a voice from our own country. T G Vaidyanathan wrote on Popper in the pages of *The Hindu* in October 1994: "We should make the study of Popper compulsory in our degenerating universities to restore rationality and universalism so essential to the creation of an open society anywhere and everywhere. The alternative roads, touted from every rabble-rousing platform in India, all lead to serfdom."

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