

REVIEW

A VIEW FROM SYDNEY: HOW TO STOVE THE ENEMIES OF SCIENCE

James Franklin, *What Science Knows And How It Knows It*.

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By Howard Sankey

James Franklin is Professor of Mathematics at the University of New South Wales. He is a prolific author on philosophical topics, who has written a controversial history of Australian philosophy, as well as a book about Catholic values in the Australian context, among an impressively broad range of topics.

In his latest book, *What Science Knows And How It Knows It*, Franklin seeks to defend the rationality of science against those he describes as the enemies of science. The enemies include the usual suspects, Kuhn, Feyerabend, the strong programme, French post-modernists. But there are unusual suspects as well. No doubt, many will be surprised to find Popper and Lakatos ranking high up the list of enemies.

However, those familiar with the work of the late, Sydney-based philosopher, David Stove, will be less surprised. Franklin is deeply influenced by Stove, who wrote a book originally entitled *Popper And After: Four Modern Irrationalists* (Oxford, 1982). Stove detects a thorough-going irrationalism in post-positivist philosophy of science, which he blames on Popper's inductive scepticism. Kuhn, Feyerabend and Lakatos followed in Popper's footsteps in neglecting induction. For the post-modernists, Franklin draws upon

Alan Sokal and Jean Bricmont's *Intellectual Impostures: Postmodern Philosophers' Abuse of Science* (London, 1998).

At the heart of the irrationalist attack on science, according to Franklin, lies a neglect of basic facts of a logical nature. The rationality of science rests on objective logical relationships found in mathematical proof and the relation between evidence and hypothesis in empirical science (p. 3). To dispel the threat of irrationalism, all that is needed is some clear thinking about logic and evidence. Like Stove, Franklin lays the blame for irrationalism on Popper's embrace of Hume's inductive scepticism. So the first task of the book is to defend the rationality of science by solving the problem of induction. Unfortunately, Franklin's treatment of the problem of induction does not succeed.

The key to Franklin's defence of induction is to argue that logic not be restricted to deduction alone. Logic includes induction. Induction is a form of logic because there are genuine relations of evidential support that "fall short of strict entailment" (p. 8). Rather than worry that induction may lead to false conclusions, philosophers should ask whether we can "rely on inductive arguments with true premises to have true conclusions *most of the time*" (p. 11). Franklin proposes to treat induction as "an inference from sample to population" with the form of the "proportional syllogism". So treated, induction rests on a "necessary mathematical truth", namely, that the "vast majority of large samples resemble the population" (p. 13). Given this, there is no risk that the justification of induction will proceed in circular fashion. Hume was wrong to suppose that induction "must rely on knowledge of cause and effect (or some contingent fact)" (p. 16). Hume's argument that the justification of induction must proceed in a circle depends on the mistaken assumption that appeal must be made to contingent facts about the world rather to logic alone.

The strategy employed by Franklin depends crucially on the logical nature of induction. While the strategy might be defensible in a more systematic development, I have two concerns with the version of the justification that Franklin actually presents. First, Franklin rightly criticizes Hume for drawing a connection between induction and causation. But he is wrong to think the circularity depends on that connection. If one argues from the past reliability of induction to its future reliability, one employs a circular defence of induction which makes no apparent appeal to causation. Second, Franklin's attempt to justify induction by arguing that it be deemed a form of logical inference fails to explain why such inferences are justified. The claim that logic includes induction does not entail that induction is justified in the same way as deduction. Franklin does not show that induction preserves truth as deduction does. Nor does he show that induction shares a formal structure with deduction. Neither does he show how the justification of deduction applies to induction. But some such rationale is required if induction is to gain its justification by way of logic. Merely saying that induction is a form of logic does not justify it. It is just playing with words.

So much for Franklin's treatment of induction. What of those whom Franklin casts as the enemies of science? I will confine myself to two brief remarks with respect to Popper and Kuhn. Franklin writes that Popper is "the true godfather of the irrationalist camp". This is because for Popper it is not rational to believe a theory "or to believe it more strongly than previously, or to prefer it to any other unrefuted theory" (p. 30). In making this point, Franklin unaccountably fails to consider Popper's idea of corroboration and thereby creates the impression that Popper has nothing whatsoever to say about the rationality of theory-acceptance. As for Kuhn, Franklin offers "a caricature of his opinions" (p. 33), a brief overview of Kuhn's account of paradigm shift. Somewhat alarmingly, given

Franklin's purported interest in the rationality of science, Franklin ignores Kuhn's later attempt to characterize a stable set of epistemic values which guide rational theory-choice.

The purpose of the book is not just to defend science against its enemies. With the world made safe for science, Franklin turns to a survey of what science knows. He writes from a realist perspective, both with respect to science and common sense, though he notes that the former sometimes corrects the latter (p. 68). This perspective leads him to comment with respect to quantum theory that "any rational person who is not a highly trained expert in the field should simply tell the QM industry to go away and report back to the rest of the intellectual world when they have sorted it out" (p. 85). Franklin regards the question of what science knows as a genuine one. Science knows much, but not everything. He writes that "there is a good deal known about the size, structure and stability of nuclei and the products of their breakup" (p. 87). But when it comes to talk of dark matter and energy, "that is reasonable speculation, but it is not knowledge" (p. 89).

Similarly with biological science, there is a tremendous amount that we know, and yet much remains unknown about such matters as the origins of life (p. 91). Franklin treads carefully around the subject of evolution. He allows that there is strong evidence that species descend from primitive forms (p. 221). But there are problems about "the ability of evolution to explain the observed complexity of organisms, given the time available for evolution" (p. 224). He treats intelligent design sympathetically, discussing the case of the bacterial flagellum, the complexity of which renders it difficult to explain as the result of piecemeal evolution (p. 227). "It needs to be understood", Franklin writes, "what a difficult task it is, logically, for either side in the debate to establish its positions on this question conclusively" (p. 228). Taking up a similarly contentious subject matter, Franklin notes that solid data supports claims of global warming, though there remain outstanding problems to

be resolved. In relation to both evolution and climate change, Franklin concludes that “the complexities of the evidence are such that a higher standard of politeness to skeptics who raise serious problems would be well-advised” (p. 235).

Franklin writes masterfully about mathematics. Unlike empirical science, in mathematics it is possible to obtain proofs that are certain (p. 107). Here, too, Franklin writes as a realist. But not as a Platonist: “the subject matter of mathematics is structure, or pattern” (p. 109). And structure is something real, in the world. As with empirical science, Franklin sees the need to defend mathematics against its enemies. He is quite harsh on Lakatos, whom he calls dishonest for suggesting that Euler’s theorem could not be established with certainty (pp. 137-8). Franklin makes the interesting point that, besides the social and natural sciences, a third category of science has recently emerged. These are the formal sciences, such as operations research, game theory and computer science, which have come out of engineering. Methods of the formal sciences may be brought to bear on the study of social phenomena, as they are in relation to the flow of road traffic (p. 184). In general, Franklin thinks the social sciences rest on the same basic logic as the natural sciences, though he does note one key difference. The study of humans is enhanced by our capacity for understanding, or *verstehen*, to use the German word which is usually employed. Franklin remarks that “concepts that need to be expressed in German are, in general, dubious, but this is an exception to that generalization” (p. 194).

Despite the commitment to defend science against its enemies, Franklin’s overall position falls well short of scientism. It is not his view that everything that can be explained can be explained by science. That is a philosophical claim, not a scientific one, and one that he rejects (p. 237). Franklin thinks there may be limits to science in at least two areas. He draws on zombie cases as well as Jackson’s Mary example to point to the limitations he sees

in a materialist theory of mind. Nor can science provide a basis for ethics. Franklin upholds Hume's is/ought dichotomy in arguing that moral values are unable to be based on empirical facts as is suggested by writers on evolutionary ethics. It is our emotions, not scientific rationality, that give us direct insight into what is morally right and wrong (p. 250).

As the above should suggest, I found this to be both a fascinating and frustrating book. Franklin displays impressive breadth and writes engagingly about the topic of what science knows. But there is more on the menu than mere philosophy. The hostility to those he regards as enemies of science suggests a deeper agenda, and at times the book reads like a belated intervention in the science wars. There may be a religious background to Franklin's handling of evolution, materialism and ethics. But if there is an underlying agenda, it is not one that is made fully explicit by anything that the author says in the text.

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