

REVIEW

What Everyone Should Know About STS

Ronald Giere

J.H. Zammito, *A Nice Derangement of Epistemes: Post-positivism in the Study of Science from Quine to Latour* (Chicago, IL and London: University of Chicago Press, 2004), x + 390 pp., £47.50/\$67.50/€59.50 (hbk), £19.00/\$27.00/€23.90 (pbk). ISBN 0-22697-861-3 (hbk), 0-22697-862-1 (pbk).

This book constitutes the best history of post-positivist philosophy and sociology of science we are likely ever to get. To a large extent, the power of the narrative derives from its being restricted to broadly *epistemological* issues. Thus the title, which mimics the title of a paper by the philosopher of language, Donald Davidson, someone little known among members of the science studies community (Davidson, 1986). The restriction to epistemological issues is surely well justified since among the founding themes of contemporary science studies were ‘the sociology of scientific *knowledge*’ (SSK) and ‘the manufacture of *knowledge*’. The opposition to positivist, particularly Popperian, accounts of the nature of scientific knowledge in these early sociological studies was explicit. Of course, as science studies has broadened into science and technology studies (STS) and includes major contributions from many others, including historians and anthropologists of science, many in the broader STS community are now not much concerned with epistemological issues. Nevertheless, this book should be required reading for all graduate students beginning their studies in the history, philosophy, or social study of science, for there is no better account of the debates about the nature of scientific knowledge that have taken place since the 1950s.

Part of what makes this a good history is that the author has not been a participant in these past debates. He is neither a philosopher nor sociologist, but an intellectual historian whose previous books include: *The Great Debate: ‘Bolshevism’ and the Literary Left in Germany, 1917–1930* (1984); *The Genesis of Kant’s Critique of Judgment* (1992); and *Kant, Herder, and the Birth of Anthropology* (2002). He exhibits the good historian’s sense

of balance and respect for the professional literature. The book's 390 pages include 277 pages of text, 93 pages of notes in reduced font, and a very good index.

This is not to say that Zammito has no point of view of his own. He does think his narrative has several morals for the present, among them that the philosophy of language is a poor resource for studying the practice of science, and that post-positivist philosophical critiques of positivism do not support radical skepticism regarding the methods or conclusions of the sciences. He does not shy away from stating these morals, but for the most part presents his arguments in the words of the protagonists themselves.

The first substantive chapter is on 'Quine and Post-positivism in the Philosophy of Science'. Here he examines what Quine himself later called the 'three indeterminacies': (1) the underdetermination of theory by evidence; (2) the inscrutability of reference; and (3) the indeterminacy of translation (Quine, 1990). Only the first of these was widely adopted by sociologists of science, along with the Duhem-Quine thesis. A major source of trouble, as Zammito demonstrates, is that there are several versions of both underdetermination and the Duhem-Quine thesis, and different arguments in support of both. Zammito does a good job of sorting out the various possible relationships between the two theses. His ultimate conclusion is that modest versions of both theses are well supported, but what became part of the post-positivist canon were less well supported and more radical versions.

The next chapter is on 'Kuhn's Misadventures with Incommensurability'. Zammito notes that Kuhn and Quine spent the 1958-59 academic year together at the Center for Advanced Study in the Behavioral Sciences at Stanford, Kuhn working on *The Structure of Scientific Revolutions* and Quine on *Word and Object*. This helps to explain Kuhn's continual involvements with the philosophy of language. In the philosophical uproar over the nature and implications of incommensurability that followed publication of *Structure*, notions of meaning, reference, and translatability came to the fore. Here Zammito sides with those who argued that what little actual incommensurability exists in the history of science generates no great epistemological problems and, moreover, that preoccupation with the philosophy of language hinders more than helps our understanding of how scientific knowledge is generated. As with underdetermination, according to Zammito, the post-positivist canon sadly incorporated the more extreme interpretations of incommensurability. In the end, although agreeing that *Structure* was the most important book in science studies published in the 20th century, he concludes that 'if, in the aftermath of Kuhn, history, philosophy, and sociology have interfused, it is alas all too apparent that they risk bringing out the worst in the interdisciplinary mutuality' (p. 89).

Following a chapter on 'The (Failed) Marriage of History and Philosophy of Science', Zammito takes up 'The Strong Program and the Social Construction of Science'. He is particularly good at reconstructing the appropriation of Kuhn's ideas in the early 1970s by dissident British

sociologists of science in their quest to displace what he terms ‘the positivist collusion between Mertonian sociology of science and the Received View’s philosophy of science’ (p. 129). Kuhn’s inspiration, without his active participation, is vividly displayed in the early writings of authors, many at the University of Edinburgh, who soon became associated with the Strong Program, such as Barry Barnes, David Bloor, R.G.A. Dolby, M.D. King, and Michael Mulkay. Especially prominent are proclamations of early adherents of the Strong Program, such as David Bloor, that their intent was to *replace* the philosophy of science in providing a definitive account of the generation of scientific knowledge. Zammito also highlights the less well known roles of the philosopher of science, Mary Hesse, and the anthropologist, Mary Douglas, in mediating between Quine and Kuhn and the Strong Program. He also surveys early criticisms, both internal and external, particularly criticisms that the appeal to ‘interests’ is too vague to be genuinely explanatory of scientific beliefs. He concludes that ‘it was, in fact, the uncritical uptake of Quine and Kuhn by the Strong Program which licensed ever more dubious postures in the “social constructionist” science studies agendas that followed’ (p. 150).

This statement leads directly into the next chapter on ‘Social Constructivism and the Turn to Microsociological Studies’. Zammito finds two revisionist programs leading away from the Strong Program by the end of the 1970s: laboratory studies typified by Latour and Woolgar’s *Laboratory Life* and Karin Knorr-Cetina’s *The Manufacture of Knowledge*, and controversy studies championed by Harry Collins. Zammito identifies these studies as initiating a trend away from the epistemic *products* of science to scientific *practice*. He sees the same trend in the major works associated with the Edinburgh group published in the mid 1980s, Andrew Pickering’s *Constructing Quarks* and Shapin and Schaffer’s *Leviathan and the Air Pump*. In reviewing the literature surrounding these two works, Zammito finds much evidence for the pernicious effects of an uncritical invocation of extreme versions of underdetermination and the Duhem–Quine thesis. The chapter ends with a brief consideration of Kuhn’s lament late in his life that he regarded the Strong Program as ‘an example of deconstruction gone mad’ (p. 181).

In Chapter 7, ‘Women, ANT’s, and (Other) Dangerous Things’, Zammito finally focuses in on Bruno Latour. (This title is a take-off of cognitive linguist George Lakoff’s book, *Women, Fire and Dangerous Things*.) Characteristically, Zammito begins with one of Latour’s most philosophical works, *Irreductions*, or, in the spirit of Spinoza and Wittgenstein, *Tractatus Scientifico-Politicus*. He describes this work as an exercise in ‘first philosophy’ (p. 184). He then moves on to discuss Latour’s *Science in Action*, which he characterizes as ‘Latour’s manual for the conduct of science studies’ (p. 191). Here he emphasizes the crucial point that, for Latour, society is as problematic as nature, so the Strong Program strategy of explaining scientific beliefs in terms of social categories is ruled out in principle. Zammito then broadens his sight to all of actor network

theory (ANT), which he regards as ‘an insurrection *against* the sociology of scientific knowledge’ (p. 195). This leads to the work of some of Latour’s collaborators, such as Michel Callon and John Law, as well as to that of critics such as Collins and Schaffer who reject the fundamental premise of ANT that humans and non-humans are to be treated symmetrically as ‘actants’. ‘In 1992’, Zammito continues, ‘there is good reason to believe, science studies hit a wall’. He is referring to the acrimonious exchanges in Pickering’s *Science as Practice and Culture* between Collins and Yearley on the one side and Latour and Callon on the other, as well as exchanges between Latour and David Bloor, including Bloor’s paper, ‘Anti-Latour’. Zammito then does an abrupt shift to a section on ‘Feminism and Science’. It is a fact that the social interests invoked in the original works of SSK never included *gender* interests, which are surely among the stronger of all social interests. Maybe it was indeed the case that, because the founders of SSK were all men, it took women to do this job. Zammito’s summary of work by feminists such as Evelyn Fox Keller, Sandra Harding, and Helen Longino is fair but too short to do justice to its subject. The chapter ends with an examination of a controversy between Andy Pickering and Peter Galison over the nature of ‘constraints’ on scientific practice. Zammito recommends a compromise that would be, from his perspective, a desirable ‘moderate historicist methodology’ (p. 228).

The final substantive chapter takes up ‘Radical Reflexivity and the Science Wars’. It begins with an examination of the ‘discourse analysis’ advocated by Michael Mulkey and Nigel Gilbert, who argued from the assumed impossibility of determining why scientists come to any beliefs to the conclusion that one can at most analyze their actual discourse. The response from many quarters, such as Steven Shapin, was to reject the premise. Explaining how or why someone comes to hold a particular theory is difficult, yes, but not impossible. Steve Woolgar, going a step further than Mulkey and Gilbert, denied that any claim about either the world or human motivation can be justified, including, reflexively, this claim itself. This was the ultimate move in a game Collins and Yearley had called ‘epistemological chicken’, seeing who can be the most skeptical. Zammito sees Woolgar’s radical reflexivity as being ‘the internal *reductio ad absurdum* of postmodernism in science studies’ (p. 251). The ultimate *external* attack began with Gross and Levitt’s *Higher Superstition* and culminated with Sokal’s hoax and what became known as ‘the science wars’. Zammito reviews this recent episode with characteristic thoroughness. He finds both virtue and vice on both sides. In the end he endorses the philosopher Philip Kitcher’s (1998) ‘Plea for Science Studies’, which laments the uncritical acceptance of radical understandings of underdetermination and incommensurability among many in the science studies community, but embraces a naturalistic, historically sensitive, epistemology.

It should now be clear that Zammito’s book has a narrative line that questions the disciplinary folk history of many in science studies who take

strong versions of doctrines like underdetermination and incommensurability for granted. He presents SSK as leading eventually to an epistemological dead end because of this uncritical adoption of questionable philosophical doctrines. Nevertheless, I still think it should be required reading for all incoming graduate students in science studies. It is in general a good thing to question the taken-for-granted assumptions of one's discipline, and there is no other single source where one can get a glimpse of, and citations to, all the relevant literature.

References

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