

## Foreword<sup>1</sup>

Chris Bissell

Open University, Milton Keynes MK7 6AA, UK  
c.c.bissell@open.ac.uk

The five decades since the publication of Thomas Kuhn's *The Structure of Scientific Revolutions* have seen enormous changes in the historical, philosophical and sociological study of science and technology. Of course, there had been significant developments in the historiography of science before Kuhn, not least Boris Hessen's seminal *The Social and Economic Roots of Newton's Principia* presented at the Second International Congress of the History of Science in London in 1931. Nevertheless, a good case can be made for the work of Kuhn being the major influence on the development of a variety of modern approaches such as 'science and technology studies' (STS), the 'sociology of scientific knowledge' (SSK), or the 'social construction of technology' (SCOT).

The thinking of Kuhn and his successors provoked lively debate in the world of the history and philosophy of science and technology during the final third of the twentieth century, debates that are still active and relevant today. On the technological side, post-Kuhnian scholars in Edinburgh (David Bloor and others), Paris (Michel Callon and Bruno Latour, for example) and most of all, perhaps, the seminal conference at Twente University in July 1984 on the social construction of technological systems (Bijker et al, 1987), brought new life to the general area of the socio-historical study of science and technology.

---

<sup>1</sup> Pisano R, Capecchi D, Lukešová A (eds) (2013). *Physics, Astronomy and Engineering. Critical Problems in the History of Science*. Proceedings of the 32th International Congress of the Italian Society of Historians of Physics and Astronomy. The Scientia Socialis Press, Šiauliai. ISBN: 978-609-95513-0-2

While pondering what to write in this foreword, I had the opportunity to attend two significant conferences in July 2013: (i) a comparatively modest meeting entitled ‘Making the History of Computing Relevant’, held at the UK’s Museum of Science, Technology and Medicine in London ([www.sciencemuseum.org.uk](http://www.sciencemuseum.org.uk)); and (ii) the huge (over 1700 participants) 24<sup>th</sup> International Conference of History of Science, Technology and Medicine in Manchester (<http://www.ichstm2013.com>). I was particularly struck by two specific ‘calls to arms’ made at these meetings.

At the London meeting, the old spectre of technological determinism seemed to have escaped complete exorcism. A number of speakers were concerned that the history of computing, and in particular the story of the development of the internet and the world wide web, was too often presented to the public (not by historians, but by politicians and the media) in an overly deterministic, even whiggish, fashion. Recent advances in information and communication technology, it is all too often said, drive economies, social change, and an ever-improving quality of life. Historians of computing (and of other scientific and technological disciplines) thus have a particular duty to give more nuanced accounts, including finding new approaches to the curating of scientific and technological artefacts and making better use of oral history.

At ICHSTM2013, the presidential address of the British Society for the History of Science was given by Hasok Chang. The title of what he called his ‘deliberately provocative address’ was ‘Putting Science back into the History of Science’. Chang looked at a number of recent claims that too much ‘history of science’ was being carried out by scholars with insufficient scientific knowledge, and he re-visited the perennial issue of whether ‘history of science’ should be a separate discipline, or better incorporated into general departments of history.

At first sight, then, we have what appear to be conflicting concerns. The historians of computing in London were worried about technologically deterministic approaches, which too often ignored the roles of society and culture. Chang appeared to be concerned that the emphasis on culture, society and context might have gone too far in the history of science.

This conflict, though, was indeed only apparent. Most significant, perhaps, was the way that Chang identified a number of issues regarding ‘the functions of the history of science requiring engagement with scientific content’. These were:

- Understanding the contingent development of scientific knowledge
- Learning about scientific method(s)
- Appreciating past scientific knowledge
- Stimulating new scientific knowledge
- Enriching scientific education
- Bridging the ‘two cultures’ gap
- Challenging the authority of scientists

This is an interesting list, but I would claim that it also applies, *mutatis mutandis*, more generally to the whole of the history, philosophy and sociology of both science and technology. In particular, all these endeavours involve being both a critical friend and an informed external advocate for scientists and technologists. And some of the best writing over the last twenty years on the history and sociology of science and technology has done exactly that: certainly no-one could accuse Harry Collins, Thomas Hughes, Trevor Pinch or Steven Shapin, for example, of lacking a rigorous scientific approach or of not being both critical friend and informed advocate of the scientific or technological disciplines that they scrutinised.

Chang also called on his audience to challenge a number of apparent dichotomies, which I’ll not list fully here, but the most interesting to me of such dichotomies are the following (some of these are Chang’s and some are my own):

*internalism versus externalism*  
*technological determinism versus social construction*  
*innovators versus users*  
*history versus philosophy versus sociology*  
*science versus technology*

Now, many scholars have wrestled with these apparent dichotomies, not least Steven Shapin, Merrit Roe Smith, Leo Marx and David Edgerton (to mention only those referenced below). Shapin's 1992 essay is particularly searching on internalism and externalism, while Smith and Marx closely interrogate determinism, and Edgerton makes a convincing case for a substantial neglect of users in our disciplines. Now, the reason that there are still heated debates on such issues – or even the occasional scholarly article or measured presidential address – is that each of the above listed terms does have its uses. The mistake, however, is to forget that almost any serious study of current or previous science or technology will have to draw on a wide variety of historical, sociological, and philosophical techniques and stances. It seems to me increasingly irrelevant to try to distinguish too rigidly between the above-opposed categories. Nevertheless, even if it can be argued that such oppositions are questionable or tendentious, we must bear in mind the history of debates on such dichotomies, and the fact that distinguished scholars have taken and defended various such positions.

Which brings me, finally, to the papers in this volume. This *Foreword* is not the place to attempt any synthesis of the wide variety of scholarly work reported here. However, when reading through the abstracts of the papers I was struck by how much of the interdisciplinarity I argue for above is apparent. Clearly, individual papers vary in the precise way that they are informed by the historiography, philosophy and (to a lesser extent) sociology of science. But taken as a whole, the volume is testament to a broad, and thriving, interdisciplinarity in our subject area, as well as an absence of historiographical dogma.

#### **References:**

Bijker, WE, Hughes, TP and Pinch, TJ eds. (1987) *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology*. Cambridge, MA: MIT Press

- Bloor, D. (1976 / 1991) *Knowledge and Social Imagery*. London, Routledge / Chicago, University of Chicago Press
- Collins, H and Pinch, T (1993, 1998) *The Golem. What you should know about Science*. Cambridge, Cambridge University Press
- Collins, H and Pinch, T (1998) *The Golem at large. What you should know about Technology*. Cambridge, Cambridge University Press
- Edgerton, D (2006) *The Shock of the Old*. London, Profile Books
- Hessen, BM (1931) *The Social and Economic Roots of Newton's Principia*. In: Bukharin, NI ed. *Science at the Crossroads*, London (Reprint New York, 1971), pp. 151–212
- Hughes, TP (2004) *Human-Built World: How to Think about Technology and Culture*. Chicago: University of Chicago Press, 2004.
- Kuhn, TS (1962, 1970) *The Structure of Scientific Revolutions*. Chicago, University of Chicago Press
- Latour, B. (1984) *Science in Action*. Milton Keynes / Cambridge MA, Open University Press / Harvard University Press
- Shapin, S (1992) *Discipline and Bounding: The History and Sociology of Science as Seen through the Externalism-Internalism Debate*, *History of Science*, Vol. 30, pp. 333-369.
- Shapin, S (1996) *The Scientific Revolution*, Chicago and London, University of Chicago Press
- Smith, MR and Marx, L eds. (1994) *Does Technology Drive History?* Cambridge MA, MIT Press