world outside the United States, and non-US readers, including this reviewer, have to work out for themselves, if they can, how the roads which may be travelled elsewhere are affected by the different points from which one is starting. This is a pity, but nonetheless the US reality is, for better and often for worse, worth knowing about for everyone else. Further, the treatment is often quite general enough for the relevance to other countries to be clear. For example, in the final chapter there is some emphasis on the danger of inequality of access to information and entertainment, which clearly applies world-wide.

If anything, the authors seem a little pessimistic. They are rightly concerned about the social isolation which may arise when people interact mainly in cyberspace. But there is some evidence that cyber-interaction can work to stimulate the face-to-face variety in local communities, for example. Likewise, 'A part of the society will have access to news and encyclopedic information at great depth and diversity, on demand' (p. 392) ... and heaven help the rest. And what, pray, is new about such a gap? Compare the books and newspapers which are, and ever were, to be found in the homes of the different social classes. There will be much better opportunities for a determined government to do something about the new gap than there were with the old one. But the warning about the entertainment gap which is likely to develop is well taken: pay-per-view instead of television programmes broadcast free to all will mean that there may no longer be programmes which the whole population of a country can, and largely does, watch. Such cultural unifiers may well be important, and worth trying to hold on to, even if we have only had them for some fifty years. This is all the more true for such countries as the UK, for which these unifiers are—if Americans will excuse the contrast—generally of better quality than most of theirs. To end on a respectful note, the greatest benign unifiers of all—global unifiers—are the better Hollywood blockbusters. Never before in human history has there been any medium which has been capable of addressing major social and political issues in a way which can both enlighten and entertain a substantial fraction of the world's population in every continent. Spielberg, for one, has done that with *Empire of the Sun, Schindler's* List, and *Amistad.* Is that not truly a brave new world which we should strive to maintain and extend?

*Andrew Tylecote*
*University of Sheffield*
*Sheffield, UK.*

**Science, Technology and Society: An Introduction**

Martin Bridgstock, David Burch, John Forge, John Laurent and Ian Lowe

*Melbourne, Cambridge University Press, 1998, xii + 288 pp., AU$29.95, ISBN 0 521 58735 2*

One of the most prominent characteristics of the field sometimes known as 'Science and Technology Studies' is the lack of a single textbook which could serve as an introduction to the area. Perhaps this should not be too surprising given the tendency of those working within the field to emphasise its interdisciplinary nature. For some, the lack of an introductory text may provide proof of the newness and specialness of 'STS'—a badge of honour that sets STS apart from the traditional, narrow disciplines from which most of its founders were refugees. Many others though would doubtless appreciate the production of a good, broad introduction to the potentially bewildering range of areas that make up STS, if only to make their own teaching lives easier.

Of course, there are certain key texts for various aspects of STS—in the case of economic approaches, for example, Christopher Freeman's *Economics of Industrial Innovation* (recently re-issued in a new edition revised by Freeman and Luc Soete[1]) remains invaluable. As for broader coverage of social, political and economic aspects of STS, perhaps Andrew Webster's attempt, also called *Science, Technology and Society*[2], is the most successful so far at providing the necessary breadth with depth. Now Martin Bridgstock, David Burch, John Forge, John Laurent and Ian Lowe, all of Griffith University, Queensland, have taken the plunge and used the experience gained from teaching a long-standing course introducing STS to produce a new contender to fill that market gap.

Bridgstock *et al.* have created a book which, at 250 plus pages, weighs in somewhat heavier than Webster's, and which takes a very different approach to the problem of introducing such a diverse field of studies. The origin of the book in course material is evident throughout, and the narrative very much follows the sort of structure one might expect of an introductory course—and is none the worse for that. The emphasis throughout is on careful explanation. Perhaps at times the authors try a little too hard—in one instance, this involves explaining to the undergraduate target reader exactly what a university is. This is not to say that the book shys away from introducing new or complex ideas—later in the same chapter the authors introduce into their discussion of the changing context of scientific work the rather abstract concept of 'mode 2 knowledge production' developed by Michael Gibbons *et al.* in their recent book *The New Production of Knowledge*[3]. Throughout the book there are references to, and examples drawn from, Australian science and technology. This is of course unsurprising given the location of the authors, and provided this British reader with a lot of useful new information. However, I suspect that if the authors had tied their book less to one particular country they might have greatly increased their sales potential.

The book opens with an introduction to the study of STS, which rather oddly makes no reference to the development of academic interest in the subject, whether in Australia or elsewhere. The introduction concentrates instead on the history of concerns over the social, political and economic context of science and technology, from Bacon's *New Atlantis* through Bernal's *Social Function of Science* to the Manhattan Project and the beginning of the post-war compact between science and state heralded in the US by Vannevar Bush's report *Science, The Endless Frontier.* (Interestingly the authors don't make clear the role the successes of wartime science had in persuading government to accept this post-war vision). The remainder of the first part of the book deals with 'Scientific and Technological Communities', beginning with a chapter by Bridgstock on 'The Scientific Community', which sketches out the different contexts in which science and technology are performed, and the different motivations scientists and their sponsors might have for conducting research.

This is followed by a chapter from Forge on 'Responsibility and the Scientist', which introduces the questions of moral philosophy which lie behind any attempt to apportion responsibility to scientists for the outcomes of their work. This in turn leads into Bridgstock's discussion of 'The Rights and Wrongs of Science', which highlights questions of ethics and propriety in scientific research, and covers cases such as the infamous Tuskegee experiment, in which the US Public Health Service studied over a period of 40 years the progress of syphilis in a large group of poor blacks from the small Alabama town of Tuskegee who had been identified as suffering from the disease, without offering treatment and without disclosing to the subjects the true nature either of their condition or of the study.

Finally Bridgstock discusses 'Controversies Regarding Science and Technology'. This begins by examining 'pure' scientific controversies, especially as regards the problem of how the scientific community achieves closure. Here the author manages to draw into the discussion insights from the rich seam of work done by sociologists on issues such as the replicability of experiments without forfeiting the introductory tone of the book. He then goes on to discuss technical controversies with wider social implications. Unfortunately this section seemed to me to be less comprehensive than that on scientific controversy, with disappointingly little on the whole debate about the social versus the technical aspects of risk assessment or about the prospects for constructive shaping of technological outcomes.

Part Two examines 'Science and Technologists in the Wider Society', beginning with a comprehensive discussion (from Forge) of the economic impacts of technological change as illustrated by the transformation of the British economy during the Industrial Revolution, and taking in economic, political and development issues in chapters by Laurent, Bridgstock, Burch, and Lowe. The chapter on 'Science, Technology and Economic Theory' provide a basic introduction, covering the relationship between technological change and growth, the work of Joseph Schumpeter, debates about firm size and innovation, and science push-demand pull debates, but perhaps could have said a little about the evolutionary approaches to economic change that have been developed at least partly in response to the stimulus of empirical studies of innovation generated over the past 30 years or so of work in the field of STS. In this regard, the books by Freeman and Coombs, Saviotti and Walsh[4] will still have a role to play in undergraduate courses in the area.

The chapter on 'Science, Technology and Public Policy' does a good job of introducing a particularly complex area, covering both theoretical approaches to policy-making and more practical questions of policy-making for science and technology, particularly in the Australian context. It would have been useful to have also had some discussion of the role of scientific and technical advice in the making of policy, which constitutes a hugely important issue in the relationship between science and society, as the ongoing BSE saga in the UK reminds us. The penultimate chapter concerning developing countries is clear and interesting, and does a particularly good job of charting changes in perceptions about the relationship between technology and development. The use of the Green Revolution to illustrate some of these points is clever, and I found the section detailing this important development to be especially informative.

The final chapter examines the rather hazy topic of 'Science, Technology and the Future'. Not an easy task, but the author (Lowe) manages to provide a good, readable finish to the book, and in the process raises some interesting questions about the potential for people to shape science and technology sustainably, for the benefit of us all.

Lastly, there are two appendices which each introduce basic study skills. The first covers the use of information resources such as on-line databases, being intended to supplement the 'further reading' guidance provided at the end of each chapter by helping the reader to do their own literature searching. The second covers the important scholarly technique of referencing, and seems particularly suitable for a book aimed at first year undergraduates.

In my judgement, this book goes some way towards filling the gap in the market which the authors identify in their introduction. True, its coverage of some areas is more comprehensive than others, and the same is true of the guidance provided for further reading. However, more often than not the authors succeed in presenting a rather complex set of overlapping areas in a clear, coherent yet honest way.

**Notes and References**

1. Christopher Freeman and Luc Soete, *The Economics of Industrial Innovation*, Third Edition, Pinter Publishers, London, 1997.
2. Andrew Webster, *Science, Technology and Society: New Directions*, Macmillan, London, 1991.
3. Michael Gibbons, Camille Limoges, Helga Nowotny, Simon Schwartzman, Peter Scott and Martin Trow, *The New Production of Knowledge: The dynamics of science and research in contemporary societies*, Sage, London, 1994.
4. Rod Coombs, Paolo Saviotti and Vivian Walsh, *Economics and Technological Change*, Rowman & Littlefield, Totowa, NJ, 1987.

*Kieron Flanagan*
*The University of Manchester*
*Manchester, UK*

**Intelligent Environments: Spatial Aspects of the Information Revolution**

Peter Droege (Ed.)

*Amsterdam, North Holland, 1997, xviii + 727 pp., US$ 184.50, ISBN 0 444 82332 8*

According to its title, this reader of essays is about 'intelligent environments', a rather perplexing notion that remains obscure through the book. No matter, the sub-title offers a more straightforward and accurate depiction of the volume as an examination of 'spatial aspects of the information revolution'.

This is a large volume—including some thirty-six essays—that covers a lot of empirical territory, including issues as diverse as art, architecture, transport, markets, environments, industrial change, and the media. These empirical issues are framed by two broad conceptual themes, space and information technology. The spatial scale shifts throughout the work from local, through regional and national, to global levels. (Perhaps we can be glad of the editor's assurance 'that we stay clear of molecular-scale space, and of dimensions that are larger than earth' (vi).) The information technology frame is itself a wide one, including themes such as telematics, virtual reality, telecommunications, electronic infrastructure, cyberspace and information management.

This extraordinary conceptual-empirical variety is both a weakness and a strength of the volume. The extent of coverage permits a broad, and for that very informative, view of the relationship between space and information technology. As such, the book helps resist the idea that the 'information revolution' has been a monolithic phenomenon that has simply annihilated the importance of spatial scale. However, the 'productive diversity' of the empirical content is overstressed, at the cost of conceptual clarity, by the rather unstructured organisation of the chapters. The editor does claim that 'the table of contents is structured to model a terrain of affinities'(v), but these affinities are opaque. I would have preferred a more straightforward structure with the thirty-six essays grouped under thematic themes, defined either spatially (e.g., 'local, regional, national, global'), technologically (e.g, 'telematics, virtual reality, cyberspace, electronic infrastructure, etc.'), or socially (e.g., 'economy, culture, society').

The essays also evidence a variety of analytical approaches, ranging from sober-empirical investigations (e.g, Garnsworthy and O'Connor), through unconventional (artistic) styles (e.g., King and Miranda) and droll-reportage (e.g., Sakamura; Yang), to the more critical pieces (e.g., Marcuse; Dutton; Lamberton). One pleasing aspect is the willingness of some authors (e.g., Choo; Droege; Marcuse) to make public policy prescriptions aimed