People, Science and Technology: A Guide to Advanced Industrial Society *by Charles Boyle, Peter Wheale and Brian Sturgess*
(Wheatsheaf Books, Brighton, 1984) pp. xii + 265, ISBN 0 7108 0188 2.

Having spent the last year wading through the dense, and often exotic, literature on the social aspects of science and technology (S & T), I feel well-qualified to review *People, Science and Technology.* Let me first put the book into context. It is now widely acknowledged that S & T are socially ambivalent, and this is manifest in the emergence of overt social conflict over various new technological developments (the debates over nuclear energy and the introduction of new technology into the workplace being good examples). In academia, concerns about the interactions of science, technology and society gave rise, in the mid-1960s, to a diffuse area of study most commonly known as 'Science, Technology and Society'. This has subsequently become an institutionalised field with specialised research centres, journals, teaching programmes and various national and international organisations. *People, Science and Technology* is an introductory text within this new field.

The book's cover blurb is quite misleading in that it promises:

> . . . a complete analysis of the social implications of technological development . . . Clearly and coherently written, this major work gives an integrated and complete review of some of the most important issues in the modern world.

In fact, the aim of *People, Science and Technology,* as given in the preface, is much more modest. The book seeks to provide an introductory account of the inter-relationships among science, technology and society, and has been written mainly for science and engineering students (of whom no specialist knowledge in the humanities or natural sciences is required) to assist in the broadening of their education. The book does not break any new ground, nor is it a state-of-the-art review.

The book is divided into three parts. The first consists of four chapters, each presenting a particular perspective on science and technology. It commences with a chapter giving a brief historical account of the main developments in S & T since the early 17th century; the other chapters examine the philosophy and sociology, the politics, and the economics of S & T. While Part I provides the background context, Part II (comprising more than half the total text) takes the introduced perspectives and applies them to a range of social issues in advanced industrial society where S & T have played a significant role. The issues discussed are: food and agriculture, health and medicine, energy, military technology, telecommunications and the mass media, scientific management and work. Finally, the third part discusses the book's central theme, that is the notion of control — of society by S & T, and of S & T by society. A useful approach, I felt, for not only is the student introduced to various theoretical perspectives, he or she is also shown the value of these in examining practical issues.

So much for the structure, what about the content? As this is an introductory text, the first chapter — the introduction — warrants particular scrutiny. This is reasonable, but it has two failings in my view. First, the discussion of the terms 'science' and 'technology' is inadequate given that the book assumes no specialist knowledge in the humanities and social sciences. There needs to be more on what these two terms have come to mean (and

symbolise) and how, in modern society, the two activities — scientific research and technological development — have tended to become fused. Secondly, a brief outline of the development and nature of advanced industrial society (parts of this are scattered throughout the book) could have been usefully given here to provide an introductory background.

Of the chapters covering the perspectives on S & T, I found that on the politics of S & T to be disappointing, and that on economics confusing (a better approach was that taken by Chris Freeman in his review of the economics of R & D in the seminal 1977 text, *Science, Technology and Society — A Cross-Disciplinary Perspective*).[1] The other two chapers seemed quite acceptable as introductory *résumés.* The politics chapter is crucial, not only because this is the perspective which is central to any analysis of the relationships among science, technology and society, but also because it provides a basis for the later chapters on control. Many of the important ideas are raised here (e.g., that technology is not neutral but rather has a political dimension), but they are not well integrated and the overall effect is somewhat wishy-washy. The chapter's second section illustrates this well: it is supposed to be about the role of S & T in social change (not defined), but what is presented is a confused mixture of theories of social change and theories of the relationship of technology and social change. For the uninitiated reader, it would have been better to have first introduced the notion of social change (and theories of the underlying dynamics), and then discussed the three approaches to technology and social change (i.e. technical change causes social change; social change causes technical change; causation is difficult to determine for the two are mutually interdependent).

I have two other criticisms of this chapter. The political nature of S & T, which is most clearly revealed when discussing control, could have been more effectively depicted as in those two 'classics' (both written for general audiences): Dickson's *Alternative Technology and the Politics of Technical Change,*[2] and the Roses' *Science and Society.*[3] As a lead into the later chapters on control, the multiple (and sometimes conflicting) roles of the state in S & T should have been discussed. Financial and infrastructural support for R&D, the subject of science policy (to which a section is devoted), is only one aspect of a much broader involvement of the state.

The chapters in Part II generally present good overviews of the sorts of issues involved, the approach being to examine the socially problematic nature of advances in S & T. The chapter on food and agriculture, for example, gives an historical review of innovation in food production and processing, and then covers food and social change, diet-associated illnesses, the politics of food production and the economics of agriculture. However, the political nature of technological development — although it is raised a number of times — is often not sufficiently emphasised. Nowhere is this more clearly seen than in the chapter on scientific management and work. Here, much of the wider political and economic context is glossed over, particularly the emergence of capitalism as the dominant mode of production, and the associated transformation of the labour process. At stake was the control by management (in the interests of capital) of the labour process, and it was to this end that Taylorism was applied (but it was not the only managerial strategy employed). The relatively unsophisticated political analysis is revealed by the concluding statement:

> Pressure groups, such as trade unions and employers' organisations should, we believe, discuss together the impact of rapid technological change on employment levels, skill content and the environment of work. These groups should assume the responsibility of co-operating together in establishing mechanisms and procedures to allow the process of technological change to take place in such a way, and to be of such a nature, as to increase the democratic freedom and general welfare of all people in society. (p.209)

This ignores many of the essential features of the existing order; for example, that, fundamentally, the interests of capital and labour conflict, so any consensus that can be engineered will be tenuous; that there are disparities in the power of different groups, so the interests and values of some groups may predominate over those of others, and that this may be obscured by prevailing ideologies, etc.

Finally, there are the issues of control. That a 'scientific world-view' dominates in contemporary society; that S & T may serve as means of control; that technology is a double-edged sword, are themes which are outlined well in the first of these two chapters. The second, on the control of S & T, does not do so well and this I argue is due to the inadequate political perspective used. Having examined the regulation of technology, technology assessment, and various proposals for alternative technology, the Clayton's conclusion shows how the authors have failed to grasp the nettle. They do so by placing the onus on the present generation in power to make the right decisions so as to ensure the continued survival of the human race and provide fulfillment for all. The key questions posed in the introduction about Francis Bacon's *New Atlantis* — "Why has the sort of human liberation Bacon envisaged not been achieved? And what can we do to bring it about?" (p.9) — remain unanswered.

Overall, I thought that this was a good, but not excellent, introductory text. It is written in a very readable style, it covers a very broad area (inevitably at the expense of depth of treatment), and is well laid out. Also, a very good guide to further reading is provided. Because of its textbook format, it may be of limited appeal to a non-academic audience. Texts such as this are appropriate reading for all science and engineering students, but I would urge that it be read in conjunction with other books like the two classics referred to previously, Mike Hales' *Science or Society?*,[4] or Jon Turney's *Sci-Tech Report,*[5] which provide the critical political perspectives lacking in *People, Science and Technology.*

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3. Hilary Rose and Steven Rose, *Science and Society,* Penguin, Harmondsworth, 1969.

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Agro-Research for the Semi-Arid Tropics: North West Australia *edited by Russell C. Muchow*
(University of Queensland Press, St. Lucia, 1985) pp. xxii + 608, $50.00, ISBN 0 7022 1776 X.

North West Australia has a low and erratic rainfall. The soils have low levels of organic matter and are susceptible to erosion by wind and water. Large areas are covered by open forests full of termite riddled trees. Transport difficulties result in high costs in getting the inputs in and the outputs out. The population is sparse — only 120,000 in the Northern Territory. Over most of the region an average man doing light work at 3 o'clock in the afternoon suffers discomfort from the heat for about half the year. At first sight, such an area would not appear to be especially attractive to the agriculturalist. Nevertheless, in March 1983 some two hundred agricultural scientists, economists and administrators gathered in Darwin for a symposium on the agricultural research which has been carried out in the North West of Australia. The papers they heard have been gathered to form this book.

The book is divided into eight parts. The first contains a keynote address by Sir John Crawford on 'The process of agricultural development and the role of agricultural research' and a brief account of the history of agriculture in North West Australia. The second is concerned with the constraints on agricultural development. Williams, Day, Isbell and Reddy discuss soils and climate, pointing out that the estimates which have previously been made of the area with potential for arable farming may have been over optimistic. They also compare the semi-arid tropics in Australia with those in India, Africa and South America and conclude that the former "have differences that require the development of unique agricultural systems". Andrew, Gowland, Holt, Mott and Strickland examine the constraints imposed by vegetation and animals and suggest that they are broadly similar to those in other semi-arid tropical regions. They produce a formidable list of actual and potential pests and diseases, from the purple swamp hen to Java downy mildew, and also stress that organisms which appear benign today may become serious pests in the future.

Part three consists of a review of the research that has been carried out in North West Australia on maize and sorghum, legumes and oilseeds (principally peanuts, soyabeans, mungbeans, sunflower and safflower), cotton, fibre crops for paper pulp production, timber and pulpwood, sugar cane, fruit and vegetables, rice, and improved pasture plants. The results are summarised, sometimes in great detail, and there are discussions of the shortcomings of existing research and suggestions for future work in each paper.

Part four is concerned with subject based research, covering soil surface management, weeds, insects, diseases, irrigation and fertilisers. There are