carries not a single picture or diagram of textile machinery. These would jar alongside accounts of agents seeking first men and then the machinery they could operate, of machinery lying idle for years until the right man arrived to operate it, and of British technical expertise becoming Norwegian managerial strength and a major link to external sources of technological and commercial information. Bruland has overcome the temptation to write about the diffusion of textile technology in terms of throstles and spindles, and the result is both illuminating and exhilarating. There is a valuable lesson here for those who still insist on explaining the development and diffusion of technology almost solely in terms of the progress of the machine.

Stuart Macdonald
University of Warwick

Deciphering Science and Technology — The Social Relations of Expertise *edited by Ian Varcoe, Maureen McNeil and Steven Yearley*
(Macmillan, London, 1990), pp. xi + 256, $12.99, ISBN 0 333 46 555 5 (pbk.).

In Science We Trust? Moral and Political issues of Science in Society *edited by Aant Elzinga, Jan Nolin, Rob Pranger, Sune Sunesson*
(Science and Technology Policy Studies, 2, Chartwell Bratt, Kent, UK), pp. 392, ISBN 0 86238 261 0.

These two texts are collections of papers presented at conferences held in Europe in the late 1980s. *Deciphering Science and Technology — The Social Relations of Expertise* presents papers from the 1987 Conference of the British Sociological Association, held in Leeds, UK. *In Science We Trust? Moral and Political Issues of Science in Society* collects papers from a conference held in Dubrovnik in Yugoslavia in May 1988. This conference had participants more varied than British sociologists, including scholars from East and West Europe, from the USA and some from Third World countries.

Both volumes have been assertively edited in terms of introductions and in the grouping of papers, which structure how the reader comes to the papers. Each set of editors demonstrates strong views on what constitutes science and technology studies and how they might be useful to practitioners.

Editors of the proceedings of the Leeds conference suggest that contemporary social change has distinctive features deriving from the characteristics of science and technology, which they feel are worth delineating. By engaging in this task, sociologists can assist practitioners and policy makers. *Deciphering Science and Technology* is aimed at those "enmeshed in the conduct of . . . policy who have no time in which to take the measured view" (p.26).

"The consequences of the episodes analysed range from the manner of eventual implementation of innovations to the question of whether the innovations are realised in anything approaching the form intended by their designers and sponsors" (p.25).

The editors see this collection as a set of descriptions of the workings of science and technology. They imply a particular view to the relation between theory and practice — that they are separable. Practitioners are offered studies which help them "keep effective track of developments as the current phase of change unfolds" (p.26). In other words, just feed the policy makers the facts! This is entirely consistent with the so-called "positive eclecticism" which the editors of this volume take as a virtue in science studies. As is often the case, refusal to identify a theoretical position hides a strong commitment. Here the notion that science and technology, and policy formulation for science and technology work through universal, rational norms.

The editors of *Deciphering Science and Technology* recognise that this approach might be problematic: "in seeking to make more rational assessments, social scientists are likely to be open to charges of being *parti patris* . . . [if they] summon the tools of empirical science to aid the increasingly pervasive implementation of 'solutions' increasingly 'technological' in form . . . do they not play a part in progressive rationalisation and 'dehumanisation'?" (p.25). They defend their stance pointing to the open-mindedness of the analyses. But, we should ask, are good intentions on the part of analysts sufficient? As readers we are left with the feeling that we would have been better served if the editors had given us some insight into the variety of ways that policy formulation can be conceived, depending on the theoretical position one takes up concerning the production of science and technology knowledge. However the shortcomings of the editors' conceptions should not cause us to prejudge what the papers themselves have to offer.

Not all the papers in the collection endorse the positions adopted by the editors. Anna Pollert gives us a passionate critique of the restructuring rhetoric of the 80s. Taking up the ways that the term 'flexibility' is used in the rhetoric of relating science and technology policy and economic considerations, she notes that workplace flexibility is all things to all people: it is a solution to the decline of manufacturing, unemployment, new technology, new consumer needs, the mobility of capital, the rapid recycling of space, and so on (p.95). Pollert concludes: "Although the array of new 'strategies' is partly the creation of consultants and their academic legitimisers, the dissemination of 'flexibility' is no mere chimera. It is a powerful ideological influence and organisational force with clear implications . . . how to live with insecurity, and unemployment and bow to market forces" (p.98).

Less passionate, although equally impressive because of its commendable attention to detail, is the paper by David Knights and Andrew Sturdy "New Technology and the Self-Disciplined Worker in the Insurance Industry". This study diverges from much of the literature on information technology through developing the notion of labour subjectivity — a placing of the concerns of the subjects of the research in the context of the social and organisational practices which in large part, form them as labouring subjects (p.127). New technology transforms the social relations of production and workers easily become more vulnerable to existential troubles concerning the value, significance or meaning of their lives; these can often find release only through effective performance in the job, something which becomes increasingly harder to achieve. Individualised workers "in forming their understanding of themselves as subjects maintain a self-discipline and a productive performance that extends far beyond what might be achieved through direct methods of management" (p.148).

A third contribution in this volume concerns the long-standing controversy over whether policy can alter social conditions so as to affect the length of human life. Mel Bartley rejects the notion that research is one kind of activity and policy making quite another. She shows how the two are inextricably mixed. In the social constructivist approach scientific problem formulation and social problem formulation are not separable, "scientists require the existence of social problem claims, in a manner analogous to the need of trade union officials for membership militancy. Without such claims or grievances there may be insufficient demand for the skills of the scientist, just as without rank and file militancy there is little need for the skills of trade union officials" (p.224).

In contrast to the line taken by the editors of the Leeds conference papers, the editors of the Dubrovnik collection *In Science We Trust?* premise their presentation of the conference papers on the understanding that developed analytic categories can clarify the issues and raise the level of discourse from the spontaneous to more systematic discourse. At the same time it is recognised as imperative that the basis upon which the analytic categories have been developed is argued for — analytic categories are contingent. This in turn implies a particular view of the relations between theory and practice; that they are inseparable. The spirit of the Dubrovnik conference has theory and practice as dual aspects of the enterprise of practicing science, developing science policy and studying science in society.

This book is aimed at scientists: "putting back the scientists into our image of science, and envisaging them as agents with ideology and interests of various kinds" (p.9). The editors hope that the book will contribute to the introduction of an ethical awareness into university training.

We are told that a controversy appeared in the Dubrovnik conference between participants wishing to give priorty to study of ethical problems as such and those promoting science studies. This controversy is evident in the report of the proceedings, and it seems that this was one of many controversies which resounded through the conference.

In Science We Trust? is in the end a disappointing text. In the technical sense it is very poorly edited. I was irritated again and again by the poor standard of English expression, and spelling and punctuation mistakes both in the discussion sections and in the texts of the papers. The inclusion of the discussion which occurred at the conference presentation is useful; it gives a strong flavour of the context. But this text is presented as written speech which does a disservice both to participants and readers. A little more attention to editing is necessary for this strategy to work effectively.

With one or two exceptions, the section on general approaches and issues is poor, there is nothing new here. The sections dealing with specific areas — social work, the environment, and questions of society and biology — where ethics systematically confront science in the context of specific issues, are more useful. Here there are several new approaches evident.

Perhaps the most interesting exchange in the Dubrovik collection is over notions of what values are. Two approaches to understanding values are represented in the first two papers. First we have Hank Verhoog concluding "in the democratic humanitarian approach . . . the concept of rationality is broadened and the search for truth is combined with respect for basic human rights and values other than optimality" (p.30). In the discussion he is immediately challenged over his universalism, having as a point of departure "universalisation of ethics, telling what is right for any actor in any situation"

(p.32). The next paper by Thomas Brante explores an alternative conception of moral discourse. He argues for understanding values as more complex and dynamic than those assuming ethics as universal entities: "morality must not be regarded as a relationship between an autonomous individual and a belief system, but to incorporate social factors as crucial elements of all moral discourse" (p.53). This sort of discussion in texts on science, technology and society will help us begin the urgent task of reconsidering the fact-value separation in science.

Comparing the two volumes, and by implication the conferences which lie behind their production, on the one hand in Dubrovnik there was a commitment to maintaining controversy and negotiation — a determination to prevent things from becoming settled. This strategy seems to be based on the understanding that the tackling of the moral and ethical issues implicit in the workings of the science/technology system is only feasible when a fluid situation is maintained. On the other hand, in the Leeds conference proceedings we have the assertion that open-mindedness, good intentions and good technique are the tools with which to oppose the technocratic trend. As a practitioner in the study of science and technology, I feel more comfortable with the first option.

Helen Verran-Watson
University of Melbourne.

Beyond The Technology Race: An Analysis of Technology Policy in Seven Industrial Countries *by Annemieke J.M. Roobeek*
(Elsevier Science Publishing, New York, 1990), pp. xiii + 269, $US92.25, ISBN 0-414-86637-0.

The author explains first the theoretical framework of the study which covers Japan, the United States, the Federal Republic of Germany, the United Kingdom, France, Sweden and the Netherlands. The issue of government intervention in the development of technology is dealt with in a comprehensive manner. The author juxtaposes the *laissez faire* policy of Adam Smith against Alexander Hamilton's theory of state intervention in the industrial process which cannot be guaranteed by the market alone. Different phases of post-war technology policy have been explained in their aspects of restructuring particularly those of Japan and Western Europe as they challenged America's dominance in industrialisation. By 1979 the author claims that all seven countries were aiming at developing innovation in the so-called 'core' technologies, like microelectronics, robotics and computers.

The author goes on to describe the progress of technological innovations in clusters which bring about long-term change. Economic theory is unable to grapple with establishing a realistic relationship between technology and the economy. The techno-economic paradigm is used to construct a conceptual framework of webs around and within which relationships are established.

The third chapter of the book has an interesting and useful analysis of Fordism as a politico-economic framework for post-war industrial development. The inherent problems of control within Fordism are described and contrasted with the Keynesian belief that policy should control the economy. The concept of