It would be invidious in a short review to select any particular contribution for special comment but those having a particular interest in the relationship between technology, ecology and the environment will find the contribution by Surajit Sinha of particular interest. It seems that rural dwellers in India are frequently more aware of the overall effects of the use of new technologies in their environment than are technologists themselves, who may have very little knowledge of local conditions. In this context, Indian rural movements such as *Mitti Bachao Abhijam,* 'save the soil campaign' and the Chipko movement to save trees and promote ecological growth and conservation are considered. The contribution can be interpreted as one against dictatorship in application of technology by professional scientists and technologists. The contribution by Yoxen on biotechnology policy will also be of interest to the environmentally aware. It illustrates how, in fact, there is very limited control over biotechnology research such as that associated with recombinant DNA. I stress, however, that each contribution has a number of interesting points to make.

The book provides useful points of view about science and technology policy in the 1980s but as far as I can see does not really make predictions beyond this, even though 'beyond' is mentioned in its title. Nevertheless, it is clear that many of the issues touched on by the authors will continue to be debated beyond the 1980s. In conclusion, the book should be a useful acquisition for any library.

Clem Tisdell,
University of Newcastle.

The Economics of Information Technology *by Paul Jowett and Margaret Rothwell.*
(Macmillan, London, 1986) pp.xiv + 108, £27.50, ISBN 0-333-39421-6.

Dr Paul Jowett is the joint author (with David Butler) of *Party Strategies in Britain: A Study of the 1984 European Elections.* Margaret Rothwell is a lecturer in economics at Oxford Polytechnic. Despite protestations to the contrary, the book is more about the importance of having the right people and the right procedures for allocating public funds in place than about applied economic analysis.

Information technology is also perceived as a bit of one thing and another. If I understand the matter right, the Japanese are a proven commercial threat because of the prowess they have shown in computer hardware, especially in relation to internal computer memory devices. However, they are now to be feared because the Japanese Government is investing heavily in 'artificial intelligence' and 'fifth generation' computers which are essentially new software developments.

To explain all this, the first chapter provides a background to the information technology race. Emphasis is placed on the way technology developments in the past were influenced by governmental outlays.

This chapter prepares us for the argument of its successor. Because the Japanese Government has demonstrated competence in the industrial policy

field, we must expect its new heavy investment in software development to be successful. Indeed, these investments have achieved some initial minor successes.

In the next chapter, on the "American Response to the Japanese Challenge", we find that the need to marshall financial resources for research relevant to the changing technology has been recognised by United States firms. But the authors do not point to any single-minded concern with the threat from new software, as opposed to hardware, developments.

The discussion of the "European Response", which follows next, is the theme of the most satisfying chapter of the book. Here, we feel, is the book as the authors perceived it could be written. There is a clear statement of the perceived problem, the available "imitative" strategies, the process of formulating the adopted policy and the criticisms levelled at the resulting programme.

The authors' discussion in the next chapter on the "British Response" begins with the complaint that the Department of Industry, upon being invited by the Japanese to send observers to the conference which marked the launching of the Fifth Generation Computer Programme, did not include three computer science academics who had earlier written to the Department suggesting that the Japanese initiative be investigated. Unfortunately, the complaint cannot be appraised. Nothing is said to indicate why a priority in letter-writing should be an appropriate criterion for determining the academic membership of such a delegation; why we should believe on any other grounds that these three were the most suitably qualified; why we should accept that these academics were the niftiest letter writers, or even whether this decision affected subsequent effects. (The text appears to imply that it did not.) The authors may have strong views on having the right people and the right procedures for allocating public funds in place, but the reader is looking for evidence that more is at stake than blatant partisanship.

The remainder of the chapter is concerned with the origins and work of the Alvey Directorate. The chapter has a substantially greater proportion of comment (from a variety of parties) than any other except, possibly, the "Conclusion". Furthermore, the comment and discussion does not clarify the relationship between the past and present performance of British firms in the hardware area, and the future prospects of these firms in the software area. That is not to say that the authors are not right in doubting that the British Government will make a significant impact in this area. What is much less certain is whether we can find anything in this chapter or the "Conclusion" that comprises a policy in which we can place more confidence.

If the fifth chapter is replete with comment, the sixth ("Strategies of European IT Companies in the 1980s") lists a great array of joint ventures and acquisitions by European electronic firms. It is a puzzling chapter in a way because the rest of the book is not that kind of industry study. Part of one sentence, *viz,* "Although in the immediate post-war period Britain reigned supreme in the computer field. . ." (p.71), highlights the lack of balance in the historical treatment of information processing. Not only is it a contentious claim but it is also one that should have been expanded upon in Chapter 1, since expectations as to the future role of the British computer industry are conditioned by the appraisal made of its past. Another generalisation, "A related factor concerns the extent to which the market, rather than

technology, determines changes in strategy" (p.85), based on the casual empiricism of this chapter, might have been given much more attention by the authors. There is always a danger in this kind of study of praising government policies consistent with successful strategies adopted by the domestic industry and of condemning domestic industry which is unable or unwilling to implement government policies which are not consistent with the strategies domestic industry needs to adopt to survive in the market place.

The "Conclusion" has two purposes. They are to investigate the interface between government and company strategies, and to focus attention on what are regarded as the four central questions raised by the analysis. These questions are, first, should government or private companies initiate public assistance to industry? Second, who is, or ought to be responsible for the framing and administering of government policies intended to assist companies? Third, who benefits from public assistance to industry? Fourth, how does this aid distort the structure of the domestic industry, the strategies of individual companies, and the nature of international competition and trade patterns?

There can be no doubt that there is material in this book relevant to both these purposes. Unfortunately, this summary does not reflect the goals of the book as reflected in its content and structure. Rather we have here a list of some of the substantive and incidental information that might be derived from a reading of the book.

It is easier to suggest that the book is inadequate than to pinpoint why this should be so. It will not add to the reputation of the publisher, yet a number of the chapters, standing alone, could well have justified the decision to offer the authors a contract. Since some of these chapters read as if they could be specimen chapters of what are essentially different books it is possible to speculate that what we have here is a particularly unfortunate collaborative effort by the authors. However, I would like to suggest that the real problem goes deeper than that, and is intimately bound up with the question as to why anyone should believe that a(nother) book should be written in this area.

While substantial investment in research and development may well be required to maintain competitiveness in the advanced technology industry, it is also necessary to marry technological advances with appropriate industrial and commercial skills. The sobering record of British post-war industrial policy suggests that the British Government would be well advised to consider the strengths and weaknesses, not only of its programmes and administrators, but also of the firms which are expected to produce and market internationally competitive products. As is clear from this book, many British businessmen, and others, doubt that success of this nature can be obtained by policies which prevent co-operation with foreign businesses and, even, governments. Now it is not irrational for the British Government, at least in some areas such as defence, to provide resources to support a wholly nationalistic approach provided it accepts the limitations of such an approach (for example, as our authors complain, British electronic firms with substantial defence interests are not as outward looking as our authors would like them to be). But it would be clearly irrational to attempt to follow a wholly nationalistic approach, at least in specified areas, without providing resources on an appropriate scale and without being confident that they could be used in an appropriate way. The book that is needed — the present authors have given us a title and some

material that could be incorporated in it — should address both the allocative and the administrative questions implied by such a nationalistic approach.

This book could be recommended to someone wanting a very readable introduction to the concern being expressed over the Japanese involvement in 'fifth generation' computers. But expressions of anxiety over the ability of the developed economies to respond to the challenge of advanced technology and the perceived better management of their international rivals abound. Unfortunately, few authors can proceed step-by-step from a clear analysis of national economic goals to persuasive accounts of the policies needed to allow these goals to be attained.

Colin Aislabie
University of Newcastle

A Dictionary of Communication and Media Studies *by James Watson and Anne Hill.*
(Edward Arnold, London, 1984), p.186, ISBN 0-7131-6411-5.

I once started to write a dictionary for Media Studies students — with two very much more dedicated and learned colleagues. Our inspiration was Raymond Williams' *Keywords*:[1] the driving force was desperation. All three of us were Media Studies teachers in tertiary education and all of us suffered daily the unthought-through eclecticism of students who pushed the most incompatible of authors into the same bed because they used the same words, e.g., mass or class or ideology. The contradictory premises — indeed belief systems — on which these different authors argued were totally ignored. Our idea was to identify a number of key words used in the literature by both Marxists and liberal pluralists — the two dominant approaches — and show the different meanings those same terms had for them.

From our argument it is obvious why Williams was the inspiration. He puts the central limitation of most dictionaries clearly in *Keywords*:

> Some people, when they see a word, think the first thing to do is define it. Dictionaries are produced and, with a show of authority no less confident because it is usually so limited in place and time, what is called a proper meaning is attached. I once began collecting, from correspondence in newspapers, and from other public arguments, variations on the phrases 'I see from my Webster' and 'I find from my Oxford Dictionary'. Usually what was at issue was a difficult term in an argument. But the effective tone of these phrases. . .was to appropriate a meaning which fitted the argument and to exclude those meanings which were inconvenient to it but which some benighted person had been so foolish as to use.

Obviously, as Williams points out, for some kinds of words dictionaries are useful, e.g., 'basilica' or 'kangaroo' or 'cricket', but for other kinds 'especially for those which involve ideas and values', dictionary definitions are totally inappropriate. These other kinds of words have 'meanings' not 'meaning' and to pretend otherwise is a gross disservice to any kind of education.