languages. Six articles describe a range of microcomputer applications within education. However, 'The ITMA collaboration' by Rosemary Fraser is of little relevance to the Australian reader, and one can become hopelessly lost in the maze of acronyms she uses. While Graham Bevis' article, 'Microelectronics in schools and colleges', is very specific to the United Kingdom, it does allow some useful comparisons to be made. The other four articles make interesting reading, especially as they concentrate on the effective use of computer technology in areas other than the traditional mathematics/science areas. Topics dealt with are: computers and the teaching of writing, microcomputers and the English teacher, computers and second language learning, and computer based learning modules for early adolescence.

While the overall presentation of this book does not lend itself to ready acceptance, much of the content is needed by teachers, who are desperately searching for assistance as the wave of computer education gains momentum. The book provides a competent introduction to the use of microcomputers in schools, but it appears on the market at the same time as a number of other books on the theme. The recommended retail price of $25.95 does not give this book any competitive edge.

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Information Technology and Industrial Policy *by Jill Hills*
(Croom Helm, London, 1984) pp. 291, $35.95 (hb), ISBN 0 7099 3701 6.

The past two decades have seen radical changes in patterns of international trade, with shifts both in the balance of trade and in political power. The international economic structure is interdependent. Exports as a proportion of the GNP have increased and there has been a marked increase of interpenetration of capital and technology. Flows of capital and technology also redistribute power. Exporting countries accrue political as well as economic power.

The central argument of this book is that governments have not ceased to protect their domestic economies with the disappearance of tariff barriers on manufactured goods. Industrial policy, in the form of tariff and non-tariff barriers, however, has been aimed at acquiring market advantage for domestic industry. Industrialised countries will increasingly rely on expanding markets in order to generate exports required to find employment in the service industries. The book aims to relate the experience of the British policy in the growth market of information technology to the broader issues of British industrial policy while recognising the role that policy plays within an international context.

The author, Jill Hills, teaches Industrial Relations at Liverpool Polytechnic and previously taught at Essex University. The book was conceived in 1977, while Hills was Hallsworth Fellow at Manchester University. The book has therefore been the result of a sustained study of its field. A review of her

previous publications demonstrates a continuing interest in political and international studies related to Britain, Japan and the US, including information technology policy and the international trading system. This book reviews the international framework and industrial policy, considering the impact of expanding markets and the role of tariff policies and industrial policy. In particular, strategies for technology and markets are considered.

Hills is concerned with the 'fit' of industrial policy within a political system; in Britain's case, the 'core' of liberal ideology towards markets is viewed at odds with the British centralised system. This conflict is seen to have created both a confusion of objectives and an incoherent strategy towards growth markets.

The primary concern of the book is with the expanding market of information technology. That market comprises the products and markets of three industries — those of computers, telecommunications and microelectronics. Those markets have been traditionally separated, although now linked by the office technology market. British information technology policy is reviewed in detail, on an industry by industry basis. This overall policy is further reviewed within a range of possible strategic options, exemplified by other countries.

The mechanisms of a government's industrial policy are related to four factors, which may themselves vary over time. These variables include: ideology towards markets, the political system of the country, the relationship between industrial capital and finance capital within the domestic economy, and the structure of the particular markets.

The market ideologies of liberal mercantilist ideology are considered in relation to the political system of the countries, including the degree of centralisation/decentralisation and bureaucratic fragmentation. Policy instruments are identified appropriate to those variables. It is argued that all countries of the industrial West have been forced to intervene in the industrial structure of their domestic economies because of the increasing openness of the world economy, although the mechanisms employed vary.

The British international and domestic markets of telecommunications, computers and microelectronics are dominated internationally by American multinationals. Domination of the British domestic market varies according to industry, but overall dependence on American technology is high. Dependence on foreign technology creates problems which in Britain, especially in the microcircuit market, have predisposed a policy in favour of domestically owned manufacturers. In addition, vulnerability of the British economy has been increased through a policy of welcoming foreign investment.

The importance of communications to defence requirements has resulted in strategies which, until recently, have been similar in all western industrialised nations. These strategies have limited imports and given public preference to domestic suppliers in the telecommunications industry. In Britain, the Post Office was responsible for communications. British Telecom was given separate status in 1962, but was always closely linked. Announcement of Telecom privatisation occurred in 1982, taking effect in 1984. Since the second world war, opinions have varied on whether telecommunications is a service or a business, and government for a long-time seemed unable to make up its mind on the matter. In general, British telecommunications has suffered from limited funds while under pressure to generate profits. The book, however,

makes few attempts to evaluate the history of telecommunications policy or to consider what effect privatisation might have.

The consideration of computer policy adds weight to Hills' overall theme. By demonstrating the British government's policy since the 1960s, the original decision to support ICL and the continuation of this policy without change by successive British governments, Hills is able to demonstrate how policies became rapidly out of tune with changing markets. Until 1980, with the establishment of a Ministry of Information Technology within the Department of Industry, government responsibility for computer policy was fragmented, goals were both unclear, and, on occasion, mutually incompatible. The goal of support for ICL was at odds with industry support as a whole. Regional interests frequently conflicted with public preference for ICL products and procurement responsibilities were fragmented. Many government departments and agencies were involved in addition to the Central Computer Agency and the National Enterprise Board. Under such a structure, emphasis was given to ICL support at the expense of a fragmented software industry and an almost non-existent peripherals industry. Additionally, multinationals have been allowed to dominate the British market in most sectors.

Microelectronics policy in Britain has been led by the world market structure. Attempts to protect the domestic economy by the use of tariff barriers have been circumvented by inward investment on the part of multinationals, especially in the manufacture of componentry. Hills also considers the strategies adopted towards information technology by Britain's overseas competitors, including USA, France, West Germany and Japan.

The book concludes by arguing the need for a national government to take control of the flows of capital and technology, when those flows limit rather than extend its power. British information technology policy is seen as no more coherent than British industrial policy in general. Emphasis has been on 'technological push' rather than 'market pull', the bureaucratic and ministerial structures are seen to be out of step with industry needs, and there is a fundamental conflict between market ideology and the government structure.

Hills recommends that Britain follows Japanese practice in limiting concentration and market dominance, in allowing centralisation in certain declining markets, in using banks for industrial finance directed by government, in reducing defence expenditure and defence related R&D, in developing institutions with overlapping jurisdictions so as to produce a bureaucracy more responsive to industrial trends, in taking away from Ministers the big technological decisions by producing long-term strategies and publishing them, and in controlling foreign investment. Hills advocates the use of non-tariff barriers specifically to promote British owned industry.

The book represents an important contribution to the field not only of information technology but industrial policy within an international context. The historical treatment of British information technology is welcomed, although the reader would have preferred to see more emphasis on the likely effects of recent policy changes; e.g., privatisation of British Telecom, appointment of a Minister of Information Technology.

The book contains some valuable lessons for Australia as so many of this country's policies reflect British patterns. The book is well researched and

authoritative. The theme is well argued and sustained. It is recommended reading for all students of industrial and information technology policy. The format of the work unfortunately does not make for easy reading. The quality of the printing and layout could have been greatly improved.

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SHORTER NOTICES

Scientific and Technical Research Centres in Australia *edited by A. Ermes* (Australian Scientific Industry Association, Melbourne, 1984) pp. vi + 427, $39.00, ISBN 0 643 03721 7.

This directory was compiled by Central Information Service, CILES, CSIRO. Over 1500 entries cover the research activities of Commonwealth and State government departments and authorities, universities, colleges, institutes of technology and a range of private and non-government organisations. The entry on each centre includes details of staff, an outline of the scope of research and current research projects, facilities and publications.

The publishers can rightly claim that this directory will be useful to those in both the private and public sectors dealing with current science and technology matters. Some of the material will date rather quickly. It is to be hoped that the planned efforts to update continually and to have the directory available for on-line interrogation do meet with success. This process would seem to justify several comments that might guide revisions. First, is it really helpful to read under so many entries that a list of research papers is available on request? — a symbol might have sufficed. Second, while complete consistency would be virtually impossible, the different extent to which social and economic research has been covered is noticeable. Third, a good case could be made for systematic inclusion of social and economic research centres that are engaged on research bearing upon science and technology.

DML