

hand is going to be that much more challenging as the only common link is the geographical delineation.

The review papers contained in Paper No.23 "examine issues in eight major sectors relevant to tropical Australia: the climate; the economy; social services and health; agriculture (including fisheries and aquaculture); the mining/energy industries; the tourism industry; natural biological systems; transport, communications and access issues; and education and research training." The contributors of these eight major sectors are all well-renowned scholars, researchers and practitioners in their relevant field. The occasional paper is rich with knowledge and know-how of research and technology in tropical Australia.

The drawback, if any, as one needs to be particularly cautious to pass judgements about an ongoing process, is the lack of an appropriate framework that will not only provide the link between all these sectors of the tropical North but also facilitate in collating and organising and the numerous consultations that have taken place. If the discussion about the appropriate framework is regarded as a futile objective, issues regarding technology, innovation and scientific know-how will all be couched in terms of uniformity of perception and by default we will be embracing the neo-classical orthodoxy. If we underplay the consequences of adopting a framework based on an orthodoxy that has strongly been "criticised...because of its limited scope, its conceptual inadequacies and its ideological bias"¹ and ignore the discussion at the level of a framework, at best, the exercise would be restricted to providing "technological fixes" to research and development in the tropical North. At worst, it would eventuate in a continuation of historical experiences of northern development of a period such as 1925-40 which is observed to be "marked by a number of characteristic features; there was an emphasis on debates, investigations, survey and negotiation but little actually happened in the way of development and settlement"². Thus the effectiveness of deliberation involving technological fixes would by and large impinge upon the conceptual adaptations about the North. Only events unfolding in the future will be judge as well as the jury.

REFERENCES:

1. F.B. Stilwell, *Economic Crisis, Cities and Regions* (Pergamon Press, Sydney 1980), p.vii.
2. L.A. Riddett, *Kine, Kin and Country: The Victoria River District of the Northern Territory 1911 — 1966* (ANU-NARU Research Monograph, Darwin, 1990), p.45 (italics added).

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Understanding Information: Business, Technology and Geography edited by Kevin Robins (Belhaven Press, London, 1992), pp.207, £39.50, ISBN 1-85293-109-4.

What is the information economy and how can it be conceptualised? How can the UK information economy be mapped and measured in terms of the

changing role of information occupations and activities and the diffusion of new information and communication technologies (ICTs)? These are the two major sets of questions addressed in this book.

It is based on research undertaken in three of the research centres established in 1986 by the UK Economic and Social Research Council as part of its Programme on Information and Communication Technologies (PICT). In particular, it represents an attempt to bring together some of the results of a joint research project, Mapping and Measuring the Information Economy, involving researchers in all three centres.¹

The term information 'economy' is used in this book in preference to alternative terms such as information 'age' or 'society', partly because the focus is on changes in economic affairs. In the introductory chapter, Kevin Robins and Ian Miles ask if it makes sense to talk about an 'information economy'. In addressing this question, they recognise that all societies have been information economies in that all economic activities depend upon human beings and their abilities to bring information to bear on their tasks. They also note how there are many alternative terms and approaches used to map and measure current economic developments. But they adopt the 'information economy' approach partly because it carries fewer theoretical associations compared with other terms. They also favour this label because it can accommodate the diverse approaches and contributions of the three research teams reported in this work.

The four chapters in Part 1 of this book are focused on the 'business of information' and address information as a commodity, an industry and sector. This comprises work by researchers based in the Centre for Communication and Information Studies (CCIS) who sought to engage critically with the kind of agenda set out in the influential 1983 report of the Information Technology Advisory Panel. The issues addressed here concern the notion of a 'tradeable information' in the UK context.

Asu Askoy makes a particularly interesting attempt to define and map the different segments of the information business. Her model distinguishes between technologically and economically distinct stages through which the information product is commodified. She also demonstrates how her model can be applied empirically in the UK context. Her discussion here also addresses the relationship between different information functions and the structure of information markets. She argues that flexibility in the information business is attained by integration as this allows firms to benefit from economies of size and scope.

Marion Banks and Gareth Locksley also address empirical, conceptual and policy issues related to concentration and centralisation in the information industries. Harry East and his colleagues indicate that a process of vertical integration is becoming apparent at many levels across the online electronic information industry. Indeed, despite their different conceptual and sectoral concerns, the tendencies towards integration and concentration and their implications represent a common feature in all four chapters by the CCIS researchers. Banks, for example, warns that market based processes in the information business contain an inherent bias against diversity and choice in the information sources necessary for democratic citizenship.

The second set of contributions originates with researchers based in the centre of Information and Communication Technologies, based with the Science Policy

Research Unit. These take questions of technological change and the diffusion of new ICTs as their common focus. The approach here is strongly influenced by the neo-Schumpeterian framework developed earlier by Chris Freeman and others. In this research, notions of a technological revolution and a changing 'techno-economic paradigm' associated with the diffusion of new ICT pervade theories of a post-industrial or information society. The chapter by Mark Matthews and Ian Miles seeks to define and differentiate new ICT from previous technologies. The other two chapters examine the changing role of the software element of ICT and the composition of the military IT sector in the UK.

The final set of contributions examines some of the geographical implications of the information economy and the diffusion of new ICTs. They critically engage with some of the more fanciful and optimistic notions of collapsing space-time relations and centre-periphery linkages. The chapter by Robins and Gillespie seeks to develop some of the theoretical elements necessary for a geographical analysis of the information economy. They address questions of globalisation and new forms of relationship between the global and the local.

John Goddard and Ken Ducatel address the development of new computer networks and other so-called 'space transcending' communication technologies. These chapters suggest that these new technologies may have opened up new possibilities to the spatial reorganisation of industry, though they have not determined a more egalitarian pattern of development. Rather the empirical evidence suggests that these technologies have so far tended to support significant regional inequalities within Britain.

As this description of its contents indicates, the book is very much the product of three complementary, but separate, research teams and approaches. No attempt is made in this book to produce any grand synthesis between the work or findings of the three centres involved. The series editor, John Goddard, suggests in the Preface that this is because one key lesson of the joint project was that such grand syntheses "are fraught with dangers".

The absence of any attempt at synthesis may be regretted by some readers, if only because it does not provide the opportunity to criticise the necessarily heroic effort required to provide a single answer to the kinds of questions posed at the outset of the research and this review. However, it certainly does not detract from the stimulating blend of conceptual and empirical research informing most of the contributions to this book. Although the empirical focus is necessarily confined to Britain, the authors critically engage with theoretical and policy issues which have a more universal appeal and relevance.

This book is highly recommended to all those seeking to develop a better understanding of the continuities and changes in economic processes associated with the diffusion of new ICTs and the changing role of information activities.

REFERENCES

1. The reviewer was a research associate in the Central Co-ordinating Unit of the PICT Programme at the time that this research was initiated.

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