breadth, and a skilled negotiator and diplomat, in his roles as Ambassador to UNESCO, a leader in the Man and the Biosphere (MAB) and World Heritage programs, Chairman of ASTEC, the Prime Minister's Chief Scientist and initiator of the Cooperative Research Centres. I had not realised that he began as a climatologist.

But there are odd omissions in his interview, for example the 1986 Slatyer review of CSIRO, making recommendations which have not, I think, altogether proved successful.

As Minister, I thought I had played a significant role in the May 1989 Science Statement which secured an additional $1.2 billion over five years for science funding. It seemed to be a victory for me (admittedly of the Pyrrhic variety). From Prof. Slatyer's account I was not even involved. Ann Moyal fails to question this. Prof. Slatyer refers to a ministerial committee chaired by John Button about arrangements over the extra funding. Its purpose was to impose an odd concept of equity — that those Ministers who had vehemently opposed my campaign for an increase were to receive the major benefits for their own programs at the expense of CSIRO.

He remarks (p. 152), oddly, that "all the Labor government ministers, that is those with science in their portfolios, have tended to be economists..." Who on earth does he mean? Simon Crean has a B.Ec. (Monash), but I doubt if he ever thought of himself as an economist. Perhaps he means John Dawkins, B.Econ. (W.A.)

Three of the subjects are women, and their interviews are among the best. I enjoyed the piece on Susan Serjeantson because her work was unknown to me.

Barry Jones, MP
Parliament House, Canberra

On the Edge of Discovery *edited by Farley Kelly* (The Text Publishing Company, Melbourne, 1993), pp. xii + 348, illust. ISBN 1 86372 029 4.

Women in science represent one of the 'silences' in Australian cultural and scientific history. This book, initiated by the Planning Group for the Centenary Celebrations of the First Woman Graduate from the Faculty of Science of the University of Melbourne, sets out to bring some voices into this silence and, at least for Victoria, to focus something of the creativity, professional involvement, and struggle of women in Australian science.

What, asks editor Farley Kelly, were the experiences of science during the past one hundred years since Leonora Jessie Little graduated with a B.Sc at Melbourne in 1893? What are the expectations of those studying or practising science today? What are the patterns, the threads that draw the continuum of past and present experience together? Have women a particular contribution to make to the future of science? Not all the questions are answered in this book, but some of the eleven contributed chapters make enlightening reading.

Sara Maroske's chapter on nineteenth-century Australian women workers in science tells again of that gifted band of scattered women collectors and illustrators, Georgiana Molloy, Louisa Ann Meredith, Louisa Atkinson, and the intrepid German professional collector Amalie

Dietrich, and reveals that out of a remarkable total of 2800 contacts maintained by Victoria's government botanist, Ferdinand von Mueller, some 240 of his collectors and correspondents were women. It also suggests that much of the record of women's participation in the widespread cultural task of collecting, sketching, packaging, describing and disseminating information about plants, animals, meteorology in the fifth continent is elusive, and often subsumed among family papers of male relatives whom they served; but that even in this early period, the rare male mentor or encourager could be crucial to women's confident contribution in science.

As the new century opened and women graduates began to emerge to enter the profession of secondary and, in rare cases, tertiary teaching, women graduates, writes Farley Kelly in her chapter "Learning and Teaching Science", "stuck together... a culture within a culture". Two Melbourne science graduates, Freda Bage and Margaret Herring, became principals of women's colleges, Bage at Queensland University, Herring at Melbourne's Janet Clarke Hall, while the Lyceam Club for professional women and graduates and the Victorian Women's Graduates' Association, where women scientists were prominent, were important forums for strengthening women's collective presence.

But social and institutional barriers, and the perspectives of male historians, greatly diminished the part played by women in the rising national profile of science. In the CSIR and CSIRO in the 1930's and 40's, as Amaya Jame Alverez writes in her sharp essay "Invisible Workers and Invisible Barriers", a number of women were employed as part of its scientific workforce, if generally in lower-ranked positions; but they neither fit within the historical frameworks devised around prominent individuals and are lost from sight, or they faced real survival struggles. Married women were clear *personna non grata*, despatched with the wedding ring, while talented wives of CSIR researchers, retained if "indispensable" and irreplacable for periods by available male researchers, could, like the determined Dr Jospehine Mackerris, just manage to sustain their important work, though the Chairman of CSIR, George Julius, declared himself in 1931, "very uncomfortable about the employment of Mrs Mackerras under her husband"! "Status-deprivation", however, kept women and wives squarely in their place.

Carolyn Rasmussen's chapter on "Six Women in the Physical Sciences", spanning a period from 1960 to recent times, turns a brief light on the lives of the Melbourne engineer, Beth Coldicutt, biometrician Dr Mildred Barnard Prentice, physicist Dr Jean Laby, chemist Gertrude Rubenstein, secondary school principal Flora Dickson, and chemist Dr Eva Nelson, and concludes that, while brilliant women were accepted in these elite male fields, they could be admired, or ignored, as long as their numbers remained small and they did not aspire to levels that threatened their male colleagues. For all these women, too, there was a distinct career choice in whether they married or remained single.

Other individual lives under the searchlight are Linden Gillbank's study of Maisie Fawcett (Mrs S.G.M. Carr) and her ecological investigations on the Bogong High Plains, and Sally Morrison's chapter on that spirited high-flyer of microbiology, Professor Nancy Millis. Rosaleen Love's chapter on "Women in the public life of science" brings us to the ongoing practical, dedicated, at times, subversive role of women participating actively in the issues of science and technology, and demanding entry into the wider public life of science to add an ingredient that women, both scientifically trained or merely concerned as citizens, perceive as missing — an awareness of the social responsibility of science and its human limitations. Remaining chapters relate to "Approaches to science in feminist theory" (Freya Mathews), "Girls and Women in Mathematics and Science" (Felicity Allen), "Gender and science education" (Sue Lewis) and a final chapter by Sally White on science communication.

This is an ambitious book, rich in the names of forgotten, overlooked, or never fully

recognised women and its names and pieces of biographical and collective data will provide valuable starting points for other researchers. For me, its historical chapters are the most valuable and carefully researched. In its attempt to embrace so many strands of activity, as well as present and potential developments in science, the book loses cohesive force. But its title is a portent. The study of women in the history of Australia's science is burgeoning: we are on the edge of discovery.

Ann Moyal
Canberra

Information and Communication in Economics *edited by Robert E. Babe* (Kluwer Academic Publishers, Boston, Dordrecht and London, 1994), pp.xv + 347, US$99.95, ISBN 0-7923-9358-9.

This book draws contributions from a number of areas within the social sciences. Its provenance is predominantly North American but it includes papers and commentaries from Australia and the United Kingdom. Coverage ranges over information economics on the one hand, and media and communication on the other. Current preoccupations with convergence notwithstanding, one would have preferred a focus on one or other of these fields. It is hard to see where contributions on the 'the politics of newsworthiness' and 'the political economy of communications research' fit into this volume. These doubts were reinforced when the final chapter concluded that "Communication and economics ...stand in a contradictory relation to one another ... they are ... mutually exclusive activities". (p. 325) Accordingly in the space available, one will concentrate on those papers which more directly addressed the theme of information economics.

Despite its less that total coherence, this book makes rewarding reading. Most of the papers use as a starting point the traditionally limited treatment of information with mainstream neoclassical economics, an approach that has viewed the price system itself as a sufficient information mechanism, with individual economic agents seeking to maximise utility on the basis of perfect information. While addressing a spectrum of topics from 'commodities' as sign systems to 'African economic development', the contributing authors are as one in their criticism of the neoclassical approach. The thrust of this volume would emphasise the wider social and communal, as opposed to narrow individual, significance of information economics, and its implications for social and economic development and for organisational and cultural change. The result is a stimulating and refreshing exploration of information economics which roams far from the reductionism of information as a mere dispeller of uncertainty and as a facilitator of exchange relationships within markets, to recognition of its implications for both economic analysis and public policy.

The collection starts with a comprehensive review of the changing role of information in economic thought by Don Lamberton. Lamberton is more restrained in his criticism of neoclassicism than are most of his fellow authors in this volume. Nevertheless, he does ascribe economists' reluctance to become involved in the study of either technology or internal organisation to a liking for optimal rather than non-optimal outcomes. He stresses the need for attention to complementarities between physical investment and human and social capital, and urges that definitions of infrastructure should include organisation as well as of more physical resources. He raises the question of asymetries both in information gathering and in information use, and of the importance not just of organisational learning but of the learning manager as embodiment of a form of organisational capital. Lamberton urges cau-