used to illustrate the present position was a situation 'in which the principal components of a nuclear power station have been developed, but the power station itself has not yet been constructed' (p. 699). Perhaps a different analogy would now be chosen in the post-Chernobyl era. The session included an unusually frank exchnage on the problem of convincing the public of the safety of waste disposal systems, representing the two opposing viewpoints of the scientific community. In spite of recent experience, there are still some scientists who believe that the public should not be told any more information than is strictly necessary, on the grounds that irrational fears will be aroused by an honest assessment. On the other hand, there are scientists who believe that they should give the public an honest and complete assessment, rather than face charges of hiding the truth.

There are many complex issues which need to be resolved for the safe disposal of radioactive waste, the enduring legacy of the age of nuclear power. This volume goes further than giving a very comprehensive picture of the current state of technical knowledge. It also offers an insight into the vexed question of how the uncertainty of complex technological systems should be communicated to the general public. This makes the volume of considerable interest to many people outside its obvious target market, the technical specialists in radioactive waste management and disposal. The price, however, presumably reflects a small print run and a low probability of the book appealing to the more general reader. It is perhaps a book to urge your friendly local library to purchase.

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The Control Revolution: Technological and Economic Origins of the Information Society *by James R. Beniger*
(Harvard University Press, Cambridge, Mass., 1986), pp. 493. ISBN 0-674-16985-9.

For the past four decades a series of phrases have spun from the pens of scholars to describe the transformations in our technological society: 'the postcapitalist society', 'the new industrial estate', 'the global village', 'the computer state', 'the technocracy', 'the second industrial divide', 'the wired society' 'telematique', 'the technocratic era' — not to mention a string of revolutions from organisational, educational, computer, scientific-technological, information, electronic, micro and microelectronic, which social scientists have perceived since the Second World War. To each of these writers it has appeared that society is experiencing a series of revolutionary changes that hinge on technological developments of recent times. This is not the view of Dr James Beniger, Associate Professor of Communications and Sociology of the Annenberg School of Communications, University of Southern California. Beniger, a historian with early training in computer technology, challenges the notion of successive social transformations and traces the roots of our contemporary society to a deep, reverberating set of changes occurring in the mid to late nineteenth century generated by the industrial revolution in manufacturing and transportation which, in terms of technological innovation and restructuring of the economy,

amounted, he claims, to 'a revolution in societal control'. Beniger calls this the 'Control Revolution'.

Two contentions underlie Beniger's thesis. The first is that contemporaries of major social change are frequently distracted by events and trends, dramatic in impact but lacking lasting significance, (a situation typified by the wide acceptance of the notion of the Industrial Revolution only in 1881, a century after its inception). The second centres on the crucial, historically evolving and accelerating role of information and information processing as the key dynamic of this century's economic and societal change.

The very word control derives from the Latin verb *contrarotulare* meaning to 'compare something against the rolls', the cylinders of paper that served as official records in ancient times. In its widest sense control represents a 'purposive influence towards a predetermined goal'. To Beniger, the concept of control is centrally tied to the twin activities of information and information processing.

What then is the 'Control Revolution'? Human societies have alwys involved some measure of control. From the earliest nation states of Egypt and Mesopotamia to the empires of Rome, Byzantium and China, bureaucracy (a word not coined until the nineteenth century) served as the general system of administrative control. In commerce, capitalism, born in the Mediterranean of the Renaissance, grew from 'control at a distance' and rose on the shoulders of stay-at-home merchants who exercised a system of control through other merchants working on commission, through the systematic collection and processing of market information, and the formation of joint ventures to spread risk and preserve mobility. Slowly other control technologies — commercial banks, regulation of insurance, marine insurance and, in the USA (where Beniger locates much of his evidence), a federal banking system and a federal bankruptcy law, emerged as major underpinnings of the commercial control structure. Additionally some half dozen commercial institutions of the early nineteenth century (including commission agents, brokerage, auction, jobbing, factorage, and country merchant systems) served to integrate developing systems of market and technological control.

By the mid nineteenth century a defined bureaucracy, and what Weber called 'rationalisation' had emerged to shape a formal set of rules governing decisions and responses. In this scenario, the Industrial Revolution with its base in steam power, feed-back mechanisms, and swifter manufacturing and transport, added a major new dimension. Railroads and the new telecommunication technologies of telegraph and telephone provided an expanding infrastructure for the control of mass distribution and consumption to both national and world markets. The result was the 'Control Revolution', 'a complex of rapid changes in the technological and economic arrangements by which information is collected, stored, processed, and communicated, and through which formal or programmed decisions might effect societal control'. From its origins in the last decades of the nineteenth century, Beniger writes, 'the Control Revolution has continued unabated, and recently it has been accelerated by the development of micro-processing technologies'. But microprocessor and computer technologies are not new forces unleashed recently upon an unprepared society: they are merely the latest instalment in the continuing development of the Control Revolution. Thus, in terms of the magnitude and pervasiveness of its impact upon society, intellectual and cultural as well as material, the 'Control revolution already appears to be as important to the history of this century as the Industrial Revolution was to the last'.

Such is Beniger's thesis which he sets down in his Preface and Introduction. The great substance, however, of this ranging and information-rich book is concerned with the diverse and diffuse historical influences which have variously and collectively contributed to the advent of the Control Revolution. The author acknowledges a heavy debt to Alfred Chandler, and his seminal work *the Visible Hand,* 'one of the few historians to exploit the view of societies as material processing systems', and to the Australian economist, Colin Clark, for his similarly path-breaking *Conditions of Economic Progress;* and he seeks to relate the notion of society as a processor to biological metaphors of control.

Yet the major strength of the book would appear to lie in its scholarly assault on a vast body of historical material relating to the evolution of control systems — automatic feedback control in the early industrial period; the development of a national infrastructure in the pre-steam period; early methods for controlling financial and insurance sectors; innovations in nineteenth century control of production; the develoments of market and retail control of distribution; the rise of advertising and mass communication technology for the control of consumption; the emergence of office technology and its consolidation as a control technology; innovations in automatic control across a century; market feedback technologies for the control of consumption; data processing innovations and developments; and even broadcasting.

This is dense territory but Beniger offers a useful range of tables of developments and innovations which offer convenient access to the reader. Less successful is his attempt to synthesise this body of information. His concept is overarching and fertile, but the book is structurally confusing. It remains, however, an ambitious and important endeavour to bring a thematic and multi-disciplinary approach to the study of the Information Society. It is supported by an impressive bibliography.

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Australian Made: Success Stories in Australian Manufacturing since 1937 *by Brian Carroll*
(Institution of Production Engineers Australian Council, Parkville, Victoria, 1987) pp. ix + 230, ISBN 0-909546-10-X.

During a visit to the Australian colonies in 1836 Charles Darwin caught a steam ferry across the Derwent in what was then Van Diemen's Land, and recorded in his journal: 'The machinery of one of these vessels was entirely manufactured in this colony, which, from its very foundation, then numbered only three-and-thirty years!' Australia has a long tradition of innovative and successful manufacturing, yet the 'Lucky Country' syndrome, the notion that we have always been able to reply on our commodity exports and have hence been lax in developing a maufacturing sector, continues to pervade the writing of economists working from a largely ahistorical perspective. Carroll's *Australian Made* is a timely and much-needed corrective to this kind of mentality. It is much easier to build on a tradition already there than to try to create one, and