

became less interested in providing financial support. Second, the development of the penny press led newspapers to embrace business, rather than politicians as their major source of income. Largely driven by the increasing costs of capital necessary to start a newspaper, newspapers became a servant of business and advertisers with an inbuilt incentive to provide larger and larger audiences for advertisers. And finally, urbanisation created a readership with an interest in making sense of the urbanisation process.

While Baldasty charts the relationship between the financial support of newspapers and their content, he also shows how publishers changed their views of readers. In the *ante-bellum* era readers were seen as voters. But by the end of the nineteenth century they were seen as consumers. This business orientation of publishers meant that they shaped and packaged news to increase its marketability. Content which was interesting, entertaining and diverting was chosen if it could meet the needs and interests of the two key sources of income, advertisers and readers. Concern about the demographics of readership led to the targeting of women and businessmen as discrete audiences. At the same time politics was de-emphasised and an independent press became to be seen as a virtue.

Baldasty's study is important because it provides us with a precedent for thinking about the structural changes which newspapers publishers must face as they move away from newsprint to various forms of electronic delivery of news. While electronic delivery of text-based news to homes has a history of failure, there is unprecedented research and development activity in this area on a number of fronts. Traditional newspaper publishers, telecommunications carriers and software companies are forging new alliances as they explore the possibility of a domestic market for text-based news. If evidence for convergence can be seen anywhere, it is in the research and development activities of newspaper publishers.

So where might Baldasty's analysis take us as we contemplate the future of the newspaper industry? There are at least two challenges which face traditional publishers. Their first task is to ensure that they do not become mere wholesale commodity suppliers, supplying news which is retailed to domestic suppliers through intelligent menuing and editing software systems which is supplied by others. The second major challenge is to understand the implications of the interactive features of electronic delivery systems for their readers and their advertisers. Will the essentially one-way publishing process be transformed to place the newspaper publisher as a manager of communications between readers and advertisers? Baldasty's timely book helps us to raise and ponder these intriguing questions.

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**Innovation, Policy and Law: Australia and the International High Technology Economy**  
by *Christopher Arup* (Cambridge University Press, Melbourne, 1993), pp. vii + 340, \$59.95  
hardback, ISBN 0 521 43003 8.

One kind of intellectual property debate revolves around the question, to which discipline does the study of technology-based innovation belong? It is a matter of interest outside universities as well as inside them, because those who are concerned with policy and practice want to know what kinds of academic specialists to consult. For a long time – too long a time – the field was divided between scientists and technologists on the one hand and

economists on the other. Many scientists and technologists were vociferous in complaining that industry did not pick up their research results. As though information were a scarce commodity! It is not scarce at all. It is more like music was for the Duke in *Twelfth Night*: excess of it makes the appetite sicken and so die. What really is scarce is the ability to pick out and put together those very few bits of information which are of value for any human purpose other than lengthening publication lists. As for the economists, there have been too many of them whose conceptual development was arrested on the level playing fields of Eton, or whatever academy it was at which they received their indoctrination.

Christopher Arup's book firmly establishes the claim of law to be a major player. If the economics of science and technology is too important to be left to economists, scientists or technologists, perhaps the lawyers can help. In a field in which many claim to be interdisciplinary, Arup achieves that aim more fully than most; because his approach is not the forbidding and hermetic one of technical law but the broad one of legal studies as professed at La Trobe University.

Which is not to say that the book makes light reading. The sweep is broad but the texture is dense. Too dense at times: thus in dealing with the commodification of natural resources, Arup admits that the "subtle arguments . . . cannot be afforded full justice here" (p. 74), and his discussion of the gene shears controversy (p. 85) is of breath-taking brevity and compression. Perhaps it was a price that had to be paid for getting such a wide range of topics into less than 350 pages of decent size print. Of the eleven chapters there are three on intellectual property, including one each on living organisms and on computer software; two chapters on competition and trade; and four on government sponsorship and entrepreneurship, including one on direct grants and tax concessions, one on procurement and offsets, and one which presents a case study of telecommunications licensing, as up to date as can be expected between hard covers.

I think that Arup is not always right on the ball; or perhaps I should be more careful and say rather that his mind does not always work like mine does. Take the case of his section headed "The Importance of Appropriability" (p. 13). The word "appropriability" does not recur after the second line, and the section seems to me to be less about appropriability than about the separation of ownership from control and the alleged concentration in English-speaking countries on realising short term profits at the expense of long range planning. But Arup is never trivial. Everything he says is worthy of attention. The framework for his analysis is provided by what he calls "liberal legal forms" such as property, contract, joint venture, partnership and incorporation. This framework is tested in particular in the chapter on competition law. He does not accept it uncritically. "If capitalism is all we have at the end of the century," he concludes on p. 301, "then care should be exercised and imagination displayed in the design and tuning of its institutions when opportunities arise." Of the need for care he gives examples in plenty, but where, oh where, are we to find enough imagination? Alas, he can give no clue to that vital question. Blandly he assures his readers that the law has an infinite capacity to adjust – but what is it adjusting to? When we come to "the extensions of the property form . . . into the domain of life itself" (p. 94), is that still "liberal"? Or alternatively, under what meaning of the word "liberal" does it fall?

It is a pleasure to be able to report that I spotted no typographical errors. That pleasure has become a rare one these days. Unfortunately, I also have a grouse about the book as a book. Under each of the eleven chapter headings there is a hierarchy of three levels of sub-headings. It is possible to work the structure out – but why should it be left to the reader to make the effort? Numbering would have helped. Some people object to numbering, and though I don't agree with them I can understand their point of view. But I can see no good reason for not setting out the sub-headings as well as the chapter headings in the list of contents. Contents lists are not used as much as they should be to act as advance organisers and help

readers to find their way. Arup hopes that his book will be rewarding even for non-specialists (p. 3) and a detailed list of contents would have been a welcome visible hand to guide them through the dense argument.

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**Gene Technology: Issues for Australia**, by *Australian Science and Technology Council*, (Australian Government Publishing Service, Canberra, 1993) pp. 151, ISBN 0 644 32561 5.

This policy document from the Australian Science and Technology Council (ASTEC) is the result of a 1992 study on research, development and commercialization of recombinant DNA technology and its implications for Australia. The document describes itself as a "considered appraisal . . . of the path which gene technology is taking and is likely to take" (p. ix) in the immediate future. As an impetus to further debate, its aim is to provide a broad, yet relatively detailed, overview of the policy issues emerging with the development of this powerful new technology. In this respect, it compares favourably with many similar documents issued by the U.S. Office of Technology Assessment.

As a first stage in the study, two working groups commissioned a variety of papers from scientists and industrialists. One group concerned itself with medical issues, the other carried out an appraisal of plant and animal gene technology. The results of these working parties were then fed into a larger round table with scientists, industry, environmental and consumer groups all represented. So, although representation in the study was relatively broad, the study was dominated nonetheless by industry and academia.

The first part of the document contains chapters that cover applications of gene technology in medicine, agriculture and food. These consist of general 'shopping lists' of what is currently and potentially possible. Some discussion of broader issues is featured in these sections, but much of that debate is saved for the later chapters which deal separately with commercialization, regulation, international links and public understanding. The general conclusion of the report is that the opportunities and challenges emerging around gene technology are determined by a complex web of scientific, commercial and regulatory factors. In particular wealth creation (a curiously British 1990's science policy term), the "science, business and community partnership" (a curiously un-British 1990's science policy term), public research focus and the regulatory environment are selected as key issues.

What is immediately striking about the sections on wealth creation, commercialization and international links is the presentation of what might be termed an industrial strategy for biotechnology. First, a general diagnosis is offered that Australian industry historically has failed to exploit its relatively strong science base. In addition, that the country is not large enough to compete in isolation in the global economy. This leads to an emphasis in the report on the internationalization of Australian biotechnology and to a number of more specific proposals. Strategic alliances between firms – both within and outside of the country – are discussed quite extensively as a key route to competitiveness. Government is also seen as playing an important part – not through strong direct intervention – but through such