the failure of various public policies to elevate national capabilities to parity with the Americans. The authors provide little explanation of whether or why public policy has fared better in Japan. Indeed, public policy is not even very clearly described. For example, the authors cite, without appropriate qualification, "the decision of the Japanese government in 1974 to allow American-owned companies to operate in Japan" (p. 171). The implication in the accompanying text that American companies have since enjoyed open access to Japanese markets would be hotly disputed by any randomly selected US semiconductor executive.

Quibbles aside, Braun and Macdonald's study remains our most complete and well-documented treatment of an important chapter in the history of modern technology.

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Videotex in Australia: Interactive Information Services *A report to the Prime Minister by ASTEC, prepared by the Technological Change Committee* (AGPS, Canberra, 1983) pp. 91, ISBN: 0-644-02691-X.

The term 'videotex' describes a service whereby the user, via the telephone and a display terminal (which can be a modified television set), can interact with a remote computer data base. Since most households in developed countries already have the necessary basic equipment, it has been widely suggested that videotex could become a new 'mass medium' for the diffusion of information. This report attempts to describe the potential impact of videotex and to suggest how the Australian government might best ensure that the benefits of videotex are achieved.

A study of this kind, which is directed at policy makers, has a responsibility to look objectively at all available evidence before making recommendations. In dealing with a new and complex technology with which policy makers are unlikely to be wholly familiar, the need for critical analysis of potential benefits and costs is even more important. The ASTEC study, while it does a good job of describing the potential benefits of videotex, is less successful in analysing whether these benefits will really materialise. As a result, policy recommendations are based on an incomplete and one-sided analysis.

The first question to be asked, then, is what are the potential benefits of videotex? The ASTEC study describes in some detail the many services which could be offered on a videotex system. First, it can offer nearly universal availability of a very wide range of information. Basic economic theory asserts that markets do not function properly unless all of the players are well-informed; as the economy becomes more complex, the diffusion of information becomes more important. Economic efficiency is not the only side-effect of readily-accessible information — democracy too is strengthened. If videotex could indeed ensure equal access to information, it would bring substantial social and economic benefits.

Secondly, videotex can make many existing activites more efficient, both for the customer and the provider. Banking transactions, for example, can be carried out from home, saving time for the client and saving the cost of

processing paper cheques for the bank. Shopping, travel arrangements and other existing services, could equally benefit. Thirdly, videotex could make possible entirely new activities, many of which — as this study is fond of noting — we cannot even imagine, but which might include, for example, access to computer programs, dialogue between widely dispersed but like-minded users (electronic meetings of clubs and interest groups) or even direct voting. While neither this study nor any other source has looked seriously at the net employment and other macroeconomic effects which videotex might have, productivity and economic activity in general could be stimulated.

The next logical step in evaluating this new technology would seem to be a serious examination of first, how likely to come about are the potential benefits described above, and, secondly, what is the appropriate role for governments. Fortunately, there are a number of countries which have already had considerable experience with videotex from which Australia can learn. Unfortunately, this study largely ignores such evidence as is available. The study's only reference to results of videotex experiments in other countries is the following:

> There has been a general reluctance in all countries to publish trial results. . . As a result, difficulty has been experienced in assessing the participation of the videotex community, and the likely direction of future developments. . . However, in France, Holland and the UK, the announcement to proceed with a full public service was made, not only before any meaningful results had been accumulated, but before the end of the trials themselves. This probably can be attributed to the enthusiasm which videotex tends to generate. (para 4.23)

This last sentence is a masterpiece of wishful thinking. Results are available, and they indicate at best a lukewarm reaction to videotex.

Great Britian was the first country to launch a public videotex service, called Prestel, which has been in operation since 1977. Originally Prestal was envisaged as a multi-purpose service which would attract a mass market (50,000 households by 1980 was the early prediction). Late in 1982, Prestel had registered only 20,000 terminals, of which 85 per cent belonged to businesses.

France has also developed a comprehensive videotex strategy based on its own videotex system, Teletel. The core of the French strategy is to make possible the mass production of a simple videotex terminal (the minitel) by purchasing in bulk and distributing at no cost to telephone subscribers. The minitel can be used as a black-and-white videotex terminal or to convert a colour television into a terminal. While not yet launched nation-wide, there have been several trials from which preliminary evidence is available. Average use amounted to two calls per week, of about 15 minutes each — the largest users being middle-class households and families with teenage children. In keeping with the image of videotex as the guarantor of well-informed citizens, it was expected that 80 per cent of the calls would be for administrative (public service) information. In fact, such calls have accounted for barely 3 per cent. The most popular use, contrary to expectations, has been for *telemessagerie,* or electronic mail and dialogue.

Germany is in the process of launching a more sophisticated videotex system, called Bildschirmtext. A trial of 2000 households was carried out from 1980 to 1983, although the sample was admittedly unrepresentative, heavily weighted as it was with well-educated, well-heeled users. Satisfaction with the

service was fairly high, although 26 per cent of the sample never used the service and 50 per cent used it only three hours per month. The small group of frequent users was made up of young people, well-educated and familiar with information technology.

The evidence appears strong that there is little demand for the general information services which have so far been provided on videotex systems. Those services which have gained some popularity — particularly those which provide some interactive capability, such as reservations systems or electronic mail — are not those which fulfill the public service role forseen for videotex. It is not simply that providing public service information is not profitable; more seriously, public service information via videotex does not appear to meet user needs. Weather, sports and local news are easier and cheaper to obtain from television and local newspapers. Information about local government, taxes, schools, etc. — which is, after all, needed only sporadically — can be obtained at no cost and in more detail from public libraries, town halls, and citizens groups. If the primary goal of developing a videotex system is to reduce the gap between the 'information-rich' and the 'information-poor', it is unlikely to succeed, both because only the 'information-rich' will use it, and because it seems to be an inappropriate medium for the diffusion of general information.

The second and third possible benefits of videotex — making existing services more efficient and making new services possible — seem to have more potential. Home banking and shopping via Bildschirmtext and electronic dialogue via Teletel have been well-received, although procedures are still cumbersome. In the US, results of marketing research by such firms as AT&T, Chemical Bank, Citibank, Knight-Ridder (a major newspaper chain), and J.C.Penney (a major retail chain) have been promising enough for several private experiments to have been started. The key question — which none of these firms can yet answer — is will people be willing to pay more for these services than it costs to provide them? Clearly, launching a videotex service means taking a substantial commercial risk.

Given the evidence which has so far accumulated on videotex, what conclusions can be drawn on the appropriate role for government in the videotex industry? A substantial government role would be justified if first, videotex was expected to generate significant social benefits; secondly, if it were likely to provide a major economic stimulus; and, finally, if these benefits would not materialize in the absence of government intervention.

It seems clear that the potential of videotex for improving the diffusion of information equally throughout society is limited. Furthermore, the economic benefits, although promising, are unproven. Finally, considerable investment in the new technology has been made without government encouragement (Knight-Ridder and Chemical Bank alone have invested $US46 million and there are at least three additional projects of an equivalent magnitude, putting US investment at well over $US100 million).

What gains have England, France and Germany secured by massive government investment in videotex? England, having invested at least 10 million pounds (some say 40 million), has yet to turn a profit and the emphasis has been shifted away from the apparently non-existent mass market toward specialised business markets. It is doubtful that such a large investment would have been made had it been known that the market would be so limited.

Estimates of French spending on Teletel are hard to come by, but must be at least as high as the lower English estimate, especially since the French programme includes the free provision of the basic terminal. Germany is still waiting for IBM to deliver the $US20 million software system which will run Bildschirmtext; full-scale initiation of the service has been delayed for at least eight months. In any event, Bildschirmtext is not even expected to break even until it has one million subscribers and this is likely to take several years. Next to these substantial figures, the ASTEC study quotes a Telecom Australia estimate of $A3.1 million to acquire (and presumably adapt) Prestel technology and $A250,000 per year maintenance for a national, public-access videotex system. The system is predicted to show a profit in its second year of operation and to pay back the original investment during the fourth year. Admittedly Australia can avoid the development costs assumed by the other countries, but estimates this low are suspiciously optimistic.

The ASTEC study resolutely overlooks the difficulties, delays and unenthusiastic reception of existing videotex systems. In discussing the "projected rate of introduction" of videotex in Australia, the study notes:

> Telecom Australia has indicated that it could probably set up a public system in about 18 months. The rate of subsequent diffusion would be determined by various factors. . . The German and French systems are now growing extremely rapidly under the impetus of government promotion. (para 5.20)

The logic demonstrated here is perfectly circular: if the government gives every citizen a terminal, the number of homes equipped for videotex will, of course, grow "extremely rapidly". However, it reveals little about the underlying appropriateness or utility of the service and less about consumer acceptance.

The idea of videotex is undeniable seductive. It is easy to imagine the world described in the ASTEC study, where every citizen has access to vast stocks of information and many convenient services. However, the 'gee-whiz' attitude to videotex adopted throughout the ASTEC study is simply unjustified given the disappointing reception of current videotex services. Videotex, or something like it, may well be viable. However, a unified system on a national scale, based on a single network and a specialized terminal, may not prove to be the best way to meet user needs. As the telephone system becomes increasingly digitalised, a more flexible and decentralized system would be possible.

The report results in four recommendations. The first recommendation, that the government encourage the establishment of common-access standards could be helpful in avoiding the development of incompatible systems, even if a completely unified, public system may not be necessary. The third recommendation, that the government establish videotex systems within certain government agencies to improve information management, is harmless and potentially useful. The fourth, to explore the legal implications of electronic information services, also appears appropriate. The second recommendation, however, which calls for Telecom Australia to draw up plans for a nation-wide, public-access videotex system, is inadequately supported by the arguments presented by the study. These arguments may have been convincing ten years ago, but they ignore too much recent

experience with videotex to serve as a sufficient guide to public videotex policy.

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Mining and Australia *edited by W.H. Richmond and P.C. Sharma*
(University of Queensland Press, St. Lucia, 1983) pp. xiv + 320, $24.95 (hb), $14.95 (pb), ISBN: 0-702-21742-5 (hb), 0-702-21752-2 (pb).

A generation ago the distinguished British scientist and author, C.P. Snow, postulated the notion of a cultural schism in economically and technically advanced societies. The essential idea was that modern society was sustained economically by the intellecutal contribution of a scientific minority, whose corporate doctrine and scholarship was incomprehensible to the cultural traditionalists and social scientists representing society at large. In the Australian context the scientific-humanist cultural schism was well-developed in Snow's time. More recently, it appears that in this country another group has developed whose scientific culture is essential to the national economy and national wealth, but which is poorly understood in the wider community. Australian mineral engineers and scientists support an efficient and productive industry which mobilises the natural wealth of the nation. However, there is only a superficial public appreciation of the role of the mineral industry's technical operations, its social and wider impacts, and its national economic and political significance. There would certainly be a pervasive view among mineral industry professionals that there are public misconceptions about the nature of the industry, its relation to societal needs and interests, and its role in meeting individual and community aspirations.

Against this background, the publication of a book by social scientists and liberal arts scholars about the Australian mineral industry should be regarded as a positive and significant step. It signals the prospect of some reconciliation between a vigorous and enterprising industry and an increasingly reflective and cautious society. Since the recent development of the mineral industry has been impeded by the intervention of various non-technical groups, any publication encouraging public knowledge of the industry is to be welcomed. The assumption implicit in this statement is, of course, that any humanistic discourse on the mineral industry would be based on solid data and rigorous analysis, with a conscious rejection of subjective value judgements.

Mining and Australia consists of ten essays by seven academics with interests in liberal arts and the social sciences. Most of the essays were developed from lectures presented in a University of Queensland Division of External Studies course entitled 'Perspectives on Mining'. The restricted representation of disciplines in the volume suggests to this reviewer that the latter title would have been preferable to that chosen. In spite of this reservation, the scope of the effort is still ambitious. It seeks to present analyses of the historical and current roles of the mineral industry in the social, economic and literary development of the nation. It also considers particular issues which have been prominent in the politicisation of mineral resource utilisation in recent years.