on labour costs has suggested that labour on-costs in Australia are not out of line with those in other developed countries. While it is true that Australian labour costs more than that in less developed countries, no one would seriously suggest paying Australian labour at, say, the going Taiwan labour rate. The correct strategy must surely be to compete in a higher quality goods market with a highly skilled workforce — as does West Germany, Sweden and North America. Labour costs are of course important but this recommendation fails to recognise the wage restraint achieved with the Accord, and the on-cost position was not well investigated.

The recommendations concerning research and investment incentives and direct grants are no surprise but could have been better backed up. Study overseas suggests that R and D performed and paid for by private industry is more directly commercially productive than both government funded research and that performed by government. This might suggest that financial incentives to encourage firms to work in this area may be preferable to other options and reference to this work would have provided more foundation to these recommendations.

One of the problems in the metal trades area is that of firms getting to know what technology is available and what it can do. This is recognized in the report and recommendations are made that aim to improve advice. Whether or not the changes suggested for the CSIRO and MASCAM are sufficient is a debatable point and a wider array of alternatives could have been canvassed on the basis of successful practise in other countries in this area.

The introduction of new technology necessarily involves industrial relations and work organisation issues. The chapter dealing with these matters is not well integrated with the rest of the Report and the labour substitution effects of some new technologies are given short shrift. It is insufficient in an aggregate sense, and on public interest criteria, to argue that natural wastage can adequately deal with the labour substitution impact. At an early stage in the report the expected labour impact of computer aided design is discussed. This type of evidence should have been examined further as it is precisely fears about job loss that can motivate Luddite behaviour which, in the long term, can be most detrimental to jobs. All in all, a rather disappointing Report, given the importance of the topic. While many of the recommendations seem reasonable, they should have been based on more adequate foundations.

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Industrial Innovation: Its Place in the Public Policy Agenda, *by Kristian Palda*
(The Fraser Institute, Vancouver, 1984) pp. 211.

Palda's book has been deceptively hailed as an important contribution to public debate and assessment of Canadian industrial innovation policy — a timely corrective to the largely bureaucratic and academic determination of policy in this field. Deceptive, because this study is yet another round in Palda's long-standing feud with the Science Council of Canada. His first

major attack, The Weakest Link (subtly subtitled "A Critique of the Science Council's Technocratic Industrial Strategy for Canada") was also published by the Fraser Institute. Launched in 1974 the Fraser Institute promotes itself as an independent economic and social research and educational organisation designed to "redirect public attention to the role of competitive markets in providing for the well-being of Canadians". With an editorial advisory board drawn from as far afield as Freiberg to London (Thatcher's economic advisor, to be precise), the role of the Fraser Institute as an academic publisher has been more stirring than substantive. Palda's book is no exception.

From the outset Palda rejects the view that innovative acumen is the requisite elixir for ailing economies. He claims that government intervention is more likely to be a costly placebo for symptoms better fixed by leaving the market to determine itself — presumably relegating high-risk innovation to pick up on a survival-of-the-fittest basis. Palda's line conforms, irreducibly, to what Barry Jones describes as the incremental traditionalist.

Palda begins with a review of the evolution of Canadian industrial policy initiatives. Given that Canada's industrial development bears striking (but not identical) resemblances to Australia's, the Australian reader might hope to glean instructive comparative insights. Palda's overview is scathing and highlights the *ad hoc* nature of ill-conceived (and often ill-timed) policy initiatives and their execution. Having set the tone for his argument, Palda then provides some general chapters on the ingredients of (firm-specific) innovative creativity and outlines the sorts of indicators needed to assess pertinent economic impact.

The ahistoricism of Palda's analysis is evident from his description of the task he sets himself: to measure the gap between optimal and realised levels of innovative performance; to find causes for the disparity; to define the extent to which policy makers can influence these factors; and to make policy recommendations, including the possibility of no policy. Despite Palda's throwaway line that there is insufficient "economic theory and adequate observation" to proceed from steps 1 to 4, a liberal sprinkling of strategically placed 'expert' quotes throughout the text identify his preference for the "no policy" option.

In a nutshell, the steps in Palda's argument are these. Firstly, current policy focus on improving R & D capability may be misdirected since research prowess alone is no guarantee of successful innovation. Secondly, innovation policies have been mainly directed to the manufacturing sector which accounts for "only about 20%" of Canada's GDP. Thirdly, although private sector expenditure on R & D is undeniable low, there is some U.S. evidence to support the benefits of "underinvestment". Fourthly, the bias of policy makers supports technical acumen at the expense of marketing objectives. Fifthly, Palda rejects the claim that Canada is handicapped by an innovation gap and that targeted incentives are necessary to redress this imbalance. Finally, he considers the prospect that government initiatives are best limited to infrastructure policies (education, retraining, promotion of competitive economic climate etc.).

Curiously, given the critical importance of the innovation gap issue to Palda's case, he does not treat it until mid-way through the book. Here Palda hammers the irrationality and antipathy of science policy-makers towards

foreign ownership (the question of foreign control barely rates a mention). He stresses the substantial R & D invisibly imported into Canada by multinationals. He notes that reported expenditures of subsidiaries seriously understate the technical and marketing know-how thus made available. He cites a study of five industries by the Economic Council of Canada which found that many successful innovations spring from imported technology and are considerably cheaper than indigenous technology. He also ignores more recent Economic Council reports which underscore the hazards of this kind of reliance as a long-term strategy.

All in all, Palda's montage of evidence shows that Canada has long benefitted from the largesse of multinationals. He implies that aspirations for indigenous capability and technological sovereignty should be tempered with due respect for the irreversibility of Canada's industrial past. This line of argument is buttressed by a stunning selection of case studies which highlight the dismal record of state-supported hi-tech ventures (CANDU, Telidon and Canadair).

The cogency of Palda's case is unfortunately marred by rhetorical and conceptual aerobics which puncture his argument with the regularity of holes in fishnet stockings. For instance, by conflating industrial policy sometimes with defence policy, sometimes with energy policy, Palda manoeuvres his way through a maze of non-sequiturs to "prove" that the case for Canada's innovation gap had been wildly exaggerated.

His collation of economic indicators and hand-picked case snapshots cancel the need to confront the possiblity of structural flaws in Canada's industrial-technological history. By default Palda is able to dismiss landmark studies, such as the "truncation thesis" (John Britton and James Gilmour, 1978) as inconsequential because they deal only with manufacturing history. Not surprisingly Palda finds the case for an innovation gap an ill-chosen peg on which to hang innovation policy.

The acid test of Palda's case for non-intervention and market-reorientation must surely be the case of Japan with its extensive industrial targeting through MITI. To this end, a concluding section compares the experience and performance of Canada with that of UK, France, USA and Japan.

Despite the panoramic range of Palda's insights here, the Japanese 'exception' remains a thorn in his overall case He suggests that until recently Japan's direct subsidy of innovation was quite modest and was primed to maximise technology transfer from foreign firms. Given that the latter was the quintessential thrust of Japan's post-war industrial strategy, it is difficult to see how the notion of 'direct subsidy' can be extricated as a separate item of investment.

The nett effect of Palda's documentation is to recommend, unequivocally, that the cost of government involvement in boosting innovative performance is too high. He claims that present policy initiatives inject market distortions more serious than the market failures they were designed to correct. What Palda conveniently ignores is that Canada's economic development (like Australia's) has been underwritten by massive State intervention — and reasons for that. With innovative performance now taking centre-stage in recipes for economic recovery as part of a world-wide trend, 'no policy' would seem an unlikely option — or, at best, an option that masks more blatant political choices.

On the score of polemic, Palda's book scarcely counters the "political posturing" of the bureaucrats and academic economists it so mightily condemns. It merely tips the scales the other way. These concerns are not peculiar to Canada. The 1985 OECD Examiners' review of the Australian situation found it necessary to remind us that, "it would be quixotic, to say the least, for Australia to pursue a purely market policy in a domain where internal market imperfections. . .are of dominating importance".

What Palda's study does usefully do is set out some of the controversies, debates and methodological problems associated with the economics of innovation. Ironically it also highlights some of the dilemmas and constraints on policy analysts — not least of which is the conflicting nature of findings on vital issues. Palda also provides a useful compendium of sources, statistical data and a colourful selection of corporate and parliamentary policy pronouncements. His snapshot case histories have the advantage of versatility (they can be drawn on to support conclusions directly opposed to those Palda makes). In short, recommended adversarial reading for introductory courses on the micro-economic impact of innovation; for the business-literate scientist; and as a case study in the politics of objectivity for the Science-Technology-and Society student.

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Future Directions for CSIRO. A Report to the Prime Minister *by the Australian Science and Technology Council*
(Australian Government Publishing Service, Canberra, 1985) pp. 94,
ISBN 0-644-04597-3.

Our national science colossus, the Commonwealth Scientific and Industrial Research Organisation (CSIRO), is once more up for review. It is now a decade since the Fraser government commissioned the first independent inquiry into CSIRO, chaired by Professor Arthur Birch. That review proceeded in the wake of fundamental questions raised about the Organisation, set up originally in 1926, and nurtured on the principle that government support of high quality, independently designed basic and applied research would serve the needs of the nation. Completed in August 1977 and influenced by some trenchant questions put by the OECD Examiners on the effectiveness of CSIRO's management of its resources in their broad report on Australian science and technology two years before,[1] the Birch report made 122 recommendations to government and marked a serious reappraisal of Australia's central organ of scientific research.

Essentially the Birch report recognised the autonomy of science and the right of scientists to take responsibility for scientific decisions, but sought to point CSIRO towards "filling a gap in the national research with strategic mission-oriented work" and identifying its research undertaking more directly with national goals. Centrally the report recommended changes in the