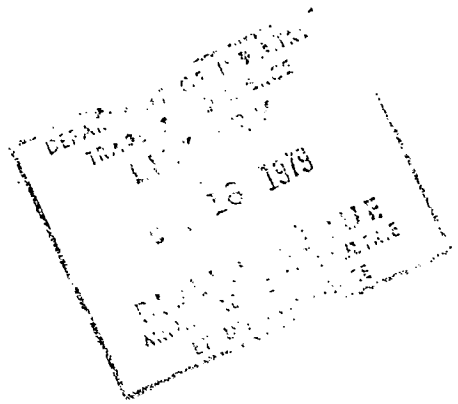
RESEARCH AND DEVELOPMENT IN CANADA

Report of the Ad Hoc Advisory Committee to the Minister of State for Science and Technology

August 1979



[Science Council of Canada]

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PREFACE

In June 1978, the Honourable Judd Buchanan, then Minister of State for Science and Technology, announced a federal government policy aimed at the stimulation of Research and Development in Canada. In that statement a target for expenditure on R & D of 1.5 per cent of GDP was set. A copy of the announcement is appended.

Shortly thereafter, Mr Buchanan solicited views on how the objectives of the R & D policy might be met. He subsequently invited the Science Council to create an Ad Hoc Committee to advise him on this matter.

The Membership of the Committee comprised:

Mr. J.J. Shepherd (Chairman)
Vice Chairman
Science Council of Canada

Mr. Frank Price (Vice Chairman)
Vice President
GSW Limited

Mr. James K. Carman
Vice President
Marketing and Technical Services
Westinghouse Canada Limited

Mr. H. Halton
Executive Vice President
Canadair Limited

Ms. P. Johnston*
Director, Policy and Research
Canadian Federation of Independent Business

Mr. T. Ortt
Director
Canadian Advanced Technology Association

Dr. L. Siminovitch
Department of Medical Genetics
University of Toronto

Mr. J.L. Thibault
Director, Economics and Communications
Canadian Manufacturers' Association

Mr. D.B. Dewar (Adviser from MOSST)
Assistant Secretary
Government Branch
Ministry of State for Science and Technology

Mr. J. Miedzinski (Secretary)
Acting Executive Director
Science Council of Canada

Initially, the Committee concentrated on the submission of recommendations to the Minister, to coincide with the meeting of Ministers of Industry held on 8 November 1978. Following that meeting, the Ad Hoc Advisory Committee held further sessions to refine and summarize its views. The following paper is the summary of the Committee's opinions, and has been submitted to the present Minister of State for Science and Technology.

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* as of July 1979, Coordinator of Economic Research, Toronto Stock Exchange.

The Committee wishes to acknowledge the valuable advice and assistance which it has received from representatives of the industry and university sectors. The evidence of widespread intent to intensify collaborative, innovative effort in Canada is impressive and encouraging.

INTRODUCTION

In June of 1978, the Honourable Judd Buchanan, then Minister of State for Science and Technology, announced a new set of "Measures to Strengthen Research and Development in Canada". The central thrust of these measures was to stimulate technological innovation in Canadian industry; the objective to increase R & D expenditures in Canada to 1.5 per cent of Gross Domestic Product (GDP) by 1983.

The Advisory Committee considers it important that Canada have a strong industrial base to provide a broad choice of meaningful employment to Canadians. To be strong, Canadian industry must be internationally competitive, which in turn requires substantial innovation. Research, design and development lie at the core of the innovation process. Thus a national commitment to produce an environment favourable to industrial R & D and innovation is vital.

The main performer of research and development must be Canadian industry. To reach the target of an R & D spending level equal to 1.5 per cent of GDP, industry has to perform an additional $1.93 billion (constant dollars) of R & D activity by 1983. Industrial funding of R & D must increase by $1.46 billion, or almost triple in just five years.

Achieving this goal will require a major, wide-ranging change of attitude in the private sector which needs to be convinced that it is good business to carry out more innovation in this country. In addition, a wide range of specific policy initiatives will be needed. Government has a key role to play in both these areas.

The Committee is encouraged by the progress that has been made, and by the increasing evidence of intent on the part of governments to stimulate technological activity.

We are convinced, however, in view of the enormous challenge, that current incentives will not produce the change of attitude, and intensification of effort required.

Government and industry have a shared responsibility to recognize and to press, wherever possible, the issue of increasing and accelerating Canadian R & D efforts. Additional tax incentives, and the more effective use of government procurement, will be required if present targets are to be achieved. Multinational enterprises must also be encouraged, as a matter of urgency, to assign more innovative product mandates to their Canadian subsidiaries. Managers of subsidiaries have a key role to play in persuading senior corporate decision-makers to assign such product mandates to Canada.

The Committee has also identified other policy directions which provide scope for increasing research and development effort in Canadian industry, such as venture capital assistance and the optimization of foreign technology imports. These opportunities should also be pursued.

A major avenue for achieving the specified R & D targets lies in the emerging policy responses to the Sector Task Force Reports. Each response should place strong emphasis on innovative effort. Given such further evidence of serious intent on the part of government, industry should conclude that it is good business to perform R & D in Canada. Industry will then respond positively, and should, through its own forums such as trade associations, join government in the campaign to persuade the community to innovate and grow. In this manner, a national cooperative effort will be stimulated.

TAX INCENTIVES FOR INDUSTRIAL RESEARCH AND DEVELOPMENT

Central to the new measures to encourage research and development in Canada is the special tax incentive for industrial R & D embodied in the April 1978 federal budget. This incentive provided for an additional allowance of 50 per cent on incremental R & D expenditures to be deducted from taxable income. The primary purpose of the incentive is to reduce the marginal cost to industry of increased R & D effort. This incremental R & D incentive was supplemented by the federal budget of 16 November 1978 which increased the basic R &D investment tax credit to 10 per cent for large firms and 25 per cent for small companies. However, the non-incremental R & D support was not increased to the level recommended by industry (a 25 per cent investment tax credit was required for all firms) and the incentives now in place are clearly inadequate to induce the required "quantum jump" in industrial research intensity necessary to achieve, within five years, the goal set by MOSST.

One of the longstanding anomalies of the Canadian R & D effort is that industry performs only 40 per cent of all research and development while in most industrial countries approximately 65 per cent of R & D is performed by industry. In recognition of this, the Committee proposes that a target for industrial R & D, equal to 65 per cent of all R & D expenditures, be explicitly incorporated into the target already set by MOSST. This would bring the structure of Canadian R & D expenditures more in line with most OECD countries.

If this target is to be attained by 1983, real growth in industrially-funded R & D* of some 24.0 per cent per annum must be achieved over the next five years. The Committee believes that such a growth rate will be impossible to sustain within existing industrial R & D establishments. A vast increase in the number of industrial R & D performers will be necessary.

Comparative analysis of R & D incentives after the November budget against those that existed under the IRDIA program indicate that such an increase in the number of industrial R & D performers is unlikely. For large firms, where most R & D is undertaken, current incentives are about the same as those provided under the IRDIA program from 1967 to 1975. In the case of small firms, the current incentives are much better. Setting aside the standard 100 per cent deduction from income for R & D expenditures, the incentives currently in place are worth, at best, 27.6 cents per dollar of expenditure in the case of large firms, and 30.8 cents per dollar for small firms. The IRDIA incentive was worth, at best, 25 cents per dollar in both cases. Due to the incremental nature of both IRDIA and the present incentives, their level of fiscal stimulus diminishes significantly in the years after R & D expenditures are first increased.

Given that during the 9-year lifetime of IRDIA, industrial R & D increased by only 23.1 per cent in real terms, it is difficult to

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* If Canada's R & D effort is to resemble average OECD spending patterns, a target of 65 per cent for industry performed R & D incorporates the expectation that industry will fund 50 per cent of all R & D expenditures by 1983.

understand how the present program, which applies about the same fiscal stimulus, can encourage similar growth annually. Little doubt exists that significantly more stimulus will be required.

In addition to the fiscal aspects outlined above, the new R & D tax incentive scheme suffers from a number of structural defects. The incentive places too much emphasis on promoting incremental R & D expenditures and may penalize firms whose R & D effort fluctuates widely from year to year. The effectiveness of the incentive can also be neutralized by combining capital and operating costs in order to determine incremental expenditure. This penalizes firms making substantial capital outlays in the base period, since increases in operating expenditures in subsequent years are "masked" by these earlier capital expenditures.

For smaller firms with lower rates of taxation, the present scheme provides incentives at about the right level by combining a significant 25 per cent investment tax credit - a non-incremental incentive - with the 50 per cent incremental deduction. However, the incentive fails to recognize the cash flow problems of small companies, and has no immediate value for firms without taxable income. This problem would be easily corrected by treating the investment tax credit of small companies as a grant to the extent that there were no taxes payable from which the credit could be deducted.

The foregoing analysis clearly indicates that the current tax incentive will prove unequal to the task of achieving the required rate of growth in industrially-funded R & D. This, in turn, means that significant improvement will need to be made to the existing incentive

scheme to meet the target specified for industrial R & D by 1983.

Despite the limitations associated with the present incentive program, the Advisory Committee views tax benefits as the preferred vehicle for expanding industrial R & D. However, in light of the serious fiscal and structural shortcomings of the present program, the Advisory Committee recommends that the current R & D tax incentive undergoes substantial change. The incentive should take the form of a single tax credit. This would provide a stronger overall incentive by encouraging firms to increase R & D spending and by providing continuous support for those expenditures.

Specifically, the current complex mix of a 50 per cent deduction for increased R & D expenditure and the varying levels of R & D investment tax credits should all be replaced by a simple 25 per cent tax credit for all R & D outlays. Both capital and operating expenditures would be eligible for the tax credit regardless of incrementality. The scheme should be implemented so that, unlike the present R & D investment tax credit, it does not affect a firm's tax deduction cost base.

Where firms do not have sufficient tax liability to take full advantage of the R & D tax credit in a given year, the Committee recommends that they be given the option of an immediate cash grant in lieu of carrying forward the accrued tax credit.

A preliminary survey indicates that the response from high-technology industries to such a scheme would be very positive.

PROCUREMENT POLICY

Government procurement, at present, is an underutilized instrument at the disposal of policy makers for enhancing industrial R & D. In 1975 for instance, goods procurement by governments in Canada (excluding Crown corporations) amounted to 12.5 per cent of total durable goods shipments in the economy. At the federal level, 70 per cent of all procurement is concentrated in eight sectors, with 40 per cent of DSS procurement concentrated in just two sectors (transportation equipment and electrical products). Major government procurements also tend to have a "demonstration effect" which encourages others to purchase products from those firms chosen as government suppliers. Thus the leverage afforded by government procurement is not in doubt.

If government procurement is to be employed in an effective manner, cooperation between various levels of government is vital. Rational employment of procurement as a tool to promote industrial development requires that coherence exist between federal and provincial purchasing policies. Mechanisms to facilitate federal-provincial cooperation in this matter have been pledged for some time. However, while Canadian industry waits, it is losing procurement after procurement to foreign suppliers. Therefore, it is recommended that the federal government intensify its efforts to rationalize its own procurement activities, while continuing to work toward reaching an agreement with the provinces on a national procurement policy.

In addition, the Committee feels that many procurement procedures currently in place prevent government purchasing from being as effective a tool as it could be for stimulating industrial R & D. In many

cases, Canadian manufacturers are inhibited from bidding successfully on major procurements because of insufficient advance notification. Smaller Canadian firms require more lead time than large international corporations to respond to a call for tenders. In other cases, for a variety of reasons, procurement specifications have been tailored to foreign products, making it difficult if not impossible for Canadian sources to bid. The Advisory Committee strongly recommends that procedures be adopted whereby, at the earliest formulation of major requirements (frequently 5 years before formal requests for proposals), Canadian industry is invited, on a selected basis, to participate in the system definition activities and subsequent pilot projects.* This would enable Canadian suppliers to respond quickly when the actual call for tenders goes out, by providing them with time, direction, and funds (pilot projects) for appropriate, complementary R & D relevant to the procurement.

Current procedures are also wanting in regard to the industrial benefits associated with procurements from foreign sources. When major offshore procurements are contemplated (e.g., military), domestic industrial benefit provisions should be directed primarily to desired technology acquisitions. Present procedures not only unduly emphasize mere Canadian dollar content, but also tend to be "passive" in that tenderers' suggestions are solicited as to what might be offered in a

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* Early system definition activities usually include informal discussions between government and industry that attempt to match the purchaser's requirements and resources, with potential suppliers' capabilities.

benefit package. A much more active stance should be adopted, and specific technology transfers should be suggested by the purchasing agency. This implies that a much more definite notion must exist within government as to what Canada wants as an offset on a major procurement; in terms of long-term technological, industrial, and economic benefit to the nation.

Although current practice, on an informal basis, is to consider some premium for the award of contracts to Canadian suppliers, the margin involved is often relatively minimal. The Advisory Committee is convinced that the economic benefits of buying Canadian are much more substantial than is currently acknowledged or reflected in premiums for domestically-produced goods.* Therefore it is recommended that present practice in this area be reviewed, and that Canadian manufactured products be afforded a procurement premium that realistically reflects the economic benefit of "buying Canadian".

Guidelines for Crown corporations and agencies should also be established to instill some notion of Canadian industrial enhancement into their procurement practices. It is suggested that all First Ministers write to the heads of Crown corporations and agencies, at both the federal and provincial levels, requesting that they adopt a "buy Canadian" policy. In addition, all future legislation governing Crown corporations should require strict adherence to such a policy.

The "unsolicited proposal" aspect of contracting-out is another

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* See also, Economic Justification for Payment of a Procurement Premium, Volume I: A Methodological Outline, Bureau of Management Consulting, DSS, Project 3-1997, Ottawa, June 1978.

area of procurement that, at present, is not utilized as effectively as it could be. Unsolicited proposals provide scope for industrial initiative, and the opportunity to perform R & D in advance of a developing requirement. It is current policy that all such proposals must relate to a known potential requirement and must be sponsored by the relevant government department. The Committee feels particularly strongly that even in cases in which a sponsoring line department cannot be located, but where the area of technology is of general long-term interest to the government, the unsolicited proposal formula should be used and funds made available for such proposals.

The Advisory Committee further recommends that procurement policy be modified to provide price premiums for the degree of technical innovation in responses to requests for tenders. This would involve making technical innovativeness a competitive factor in submissions, and adjusting pricing formulae to reward technical ingenuity with price premiums.

Similar incentives could be injected into procurement policy to encourage the diffusion of technology in Canadian industry. Consideration should be given to providing major contractors with a negotiated price premium, dependent upon the degree to which new technology is generated through sub-contracts to second- and third-tier suppliers in Canada. Such a policy would facilitate the creation of badly needed nodes of technological strength in Canadian industry.

A formal review should also be required for any procurement recommendation in which a non-Canadian supplier is contemplated. Such

a review would relate to all government procurements over a specific value, and would take place before final submission of the procurement to the appropriate federal or provincial treasury. In the event that this review results in ratification of an offshore procurement, the arguments supporting such a decision should be open to public scrutiny.

VENTURE CAPITAL FOR TECHNOLOGICAL INNOVATION

A major deterrent to successful technological innovation is lack of financial support for commercial production and marketing of new products and processes. Technological innovation is inherently a high risk proposition. Investment in innovation involves significantly more risk than investment in other forms of business. As a result, there is little incentive for individuals to invest in risky technological ventures under present tax regulations, when many safer forms of investment are readily available.

In partial recognition of this problem, the former Minister of State for Small Business proposed that a new investment vehicle should be established. In a White Paper published in May 1978, the Minister called for the formation of Venture Enterprise Investment Companies (VEIC) with a minimum capitalization of $2.0 million each.* The incentive for individuals to invest in a VEIC is provided by provisions which would allow 50 per cent of all losses incurred to be written off

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* Minister of State for Small Business, Improving the Equity Financing Environment for Small Business in Canada, presented by the Honourable A.C. Abbott, Industry, Trade and Commerce, May 1978.

against other income.

The Advisory Committee does not believe that the present VEIC proposals will prove effective for tapping pools of individual savings, nor will they satisfy the venture capital requirements of small technologically-oriented enterpreneurs. While VEICs may in fact conglomerate risk capital already available from small investors, it is unlikely that they will significantly increase the supply of such capital.

After much consideration, the Committee has concluded that income tax incentives are the most appropriate vehicle for increasing the supply of venture capital available for technological innovation. Specifically, private investors should be allowed to write off one hundred per cent of any equity investment loss in an eligible small technology-based business (excluding natural resource companies). In addition, all shares of Canadian-controlled private corporations should be made exempt from capital gains tax if the investment is held for at least five years. Also, existing VEIC proposals should be modified to allow for a minimum capitalization of only $250,000 rather than $2.0 million. This would encourage the formation of small local investment groups and thus provide broader regional coverage. Existing investment laws and regulations should be reviewed from the perspective of modifying them to promote a higher degree of participation by institutional investors in the provision of venture capital for technological innovation.

The Committee is especially struck by the potential of an equity investment model currently operational in the province of Quebec. The

province provides a 25 per cent tax credit to individuals who invest in a local equity investment pool (SODEC). This pool, which is managed by a board of local businessmen, makes equity investments in the start-up and expansion of local manufacturing enterprises. The Advisory Committee recommends that the federal government seriously investigate the provision of a broad federal financial underpinning for this important industrial policy initiative.

IMPORTATION OF FOREIGN TECHNOLOGY

Canada has an apparently sophisticated manufacturing industry, equipped with modern machinery and utilizing a high level of production skills. Yet with a few notable exceptions, it lacks a significant autonomous capability for technological innovation. Because Canada imports most of its technology through foreign direct investment, Canadian manufacturing is technologically dependent.* As a consequence of this dependence, much of Canadian industry merely replicates products designed and developed elsewhere, rather than developing original or unique products of its own for international markets. In essence, there are too few instances where Canada has acquired a sufficiently independent technological capability, or the right to adapt foreign technology to uniquely Canadian requirements.

It is generally acknowledged that technology is a decisive factor

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* Technological dependence implies that a firm or industry not only relies upon others for transfers of technology, but in fact is unable to produce its own technology and unable to assimilate or build on technology that is transferred to it.

in both product competitiveness and productivity. However, it is impossible for advanced nations such as Canada to develop a "comparative advantage" based on either obsolescent technology or second-hand product designs. Given that the majority of Canada's technology-intensive manufacturers are technologically-dependent, it is quite unrealistic to expect them to be able to compete in world markets, or even against imports in the domestic market.

The foregoing analysis suggests that if Canadian manufacturers are to compete successfully in world markets during the 1980s, the technological-dependence of Canadian industry must be reduced. This can be accomplished by altering the manner in which Canada imports most of its technology. Specifically, greater use should be made of "arms-length" licensing agreements and joint ventures, and less emphasis should be placed on intracorporate transfers of technology which are often restrictive in nature. This would enhance the positive impact of technology imports and would not lead to a great reduction in the absolute volume of technology imported.

Licensing agreements between offshore suppliers of technology and Canadian manufacturers provide significant scope for enhancing the technological capability of Canadian industry. However, frequently such licences for the use of patents or industrial designs and know-how incorporate restrictions on the markets to be served, and the uses to which the technology may be applied or they impose other limitations on the licensee. Obviously, such restrictions can seriously limit the freedom of a licensee to exploit imported technology in the manner most beneficial to the Canadian economy. Restrictive business practices of

this nature should be eliminated through review of all new licensing agreements and the subsequent removal of restrictions placed on Canadian licensees that are in conflict with Canada's long-term industrial development objectives. Approval of such licensing agreements should be automatic if no objections are raised by the appropriate review agency within a reasonable period of time (i.e., one month). This type of policy initiative would greatly strengthen the hand of Canadian subsidiaries in dealings with parent firms, and would ensure that independent domestic firms get a "fair deal" in the international technology market.

The formulation of policies designed to ensure consistence between technology imports and the means and objectives of present strategies affords an opportunity to articulate fully a future industrial strategy for Canada. The Advisory Committee believes that such an opportunity to develop an explicit industrial stratregy should not be ignored.

WORLD PRODUCT MANDATES FOR CANADIAN SUBSIDIARIES OF MULTINATIONAL CORPORATIONS

Because of the sheer pervasiveness of foreign ownership in the Canadian manufacturing sector (especially in high-technology industries), it is vital that Canadian subsidiaries of multinational corporations make the maximum possible contribution to our economy. It is critical that they convert from purely branch plant production operations tailored to the domestic market, to more technically advanced, export-oriented units. More innovation must be carried out by this sector.

The most realistic and viable long-term solution is the assignment

of world product mandates to Canadian subsidiaries by multinational parent firms. Assigning a world product mandate to a subsidiary involves making the subsidiary totally responsible for research, design, development, production, and world-wide marketing of a selected product or product line. It is generally acknowledged that subsidiaries with world product mandates contribute substantially to Canadian employment and exports. There are an increasing number of such examples.

In recognition of the need to provide guidelines for multinational corporations operating in Canada, the Minister of Industry, Trade and Commerce, in July 1975, issued "New Principles of International Business Conduct", which are appended to this report. The Committee feels that it is highly desirable to reopen dialogue with industry on these "Principles" with a view to evolving more specific guidelines. It is clear that, in order to be most practical, such guidelines should be sector-specific, and even company-specific. Views from industry should be solicited to ensure that the process is both cooperative and positive.

During its work, the Committee has secured tentative opinions from industry representatives as to what might be applicable and acceptable as guidelines from government to multinational enterprises relative to the according of world product mandates to Canadian subsidiaries. The opinions developed indicate that:

1) guidelines would be welcomed from government, but should be the subject of discussion and negotiation before becoming final;

2) guidelines would probably need to be at least sector-specific, and might even need to be negotiated with individual corporations; and

3) in developing the world product mandate, a two-phase approach might be needed; the first relating to the plan for the product mandate, and the second relating to implementation of the plan.

In this context, it was suggested that the guidelines should call for:

a) The creation of a corporate plan for the subsidiary, to increase the percentage of its sales derived from world product mandates, over a five-year period.

b) The creation of a corporate plan to increase systematically, research and development to a level consistent with the achievement of the Canadian objective of 1.5 per cent of GDP by 1983, (a rate of R & D as a percentage of sales could be struck for each sector).

c) The creation of a corporate plan to achieve a significant increase in corporate Canadian content as a percentage of sales, by increasing value-added in-house, and through development of new Canadian sources for components and materials and services.

d) The creation of plans to achieve a company trade balance in goods and services, so that within five years a balance of exports and imports for the subsidiary could be achieved, on a running three-year average basis.

It was also suggested that the guidelines should call for:

a) retention of a share of earnings in Canada, sufficient to support the growth potential of the Canadian company; and

b) achievement of significant participation by Canadians in senior and middle management positions and on boards of directors of the subsidiary company.

As noted, these types of guidelines have been suggested by company representatives, and might well be applicable to the electronics and aerospace sectors. Similar guidelines could be sought from and reviewed with, other sectors.

Based on the negotiation and acceptance of these guidelines, and upon the negotiation and approval of the plans for compliance noted above, subsidiaries would then be eligible for the special incentives for R & D that are available from the federal government.

The problem remains of possible changes in corporate policy which might reverse the "product mandate character" of the subsidiary. It has been suggested that all such incentives for R & D, where currently in the form of grants or tax benefits, might be considered as forgivable loans. These loans would be repayable to the government only if the guidelines are broken, providing for recapture of the assistance in such a case.

An issue of central importance is that of ensuring that guidelines are developed through dialogue and negotiation with industry, possibly through the trade associations. Such a dialogue would be fruitful in many ways, and could result in a rapid and positive response to the need for more innovative activity in Canada.

MANPOWER

The growth in R & D expenditures required to achieve the MOSST objectives will greatly increase the demand for highly qualified manpower in Canada. Indeed, shortages appear to exist already in computing science and some areas of engineering. In addition, the Deans of Management

report that the resources currently devoted to management education in Canada are grossly inadequate. High risk and rapid change make top quality managers imperative to technology-intensive industries. Yet Canadian universities presently allocate only 5 per cent of their faculty members to management schools, despite the fact that these schools represent 12 per cent of the student population.

The strong impression gained by the Committee is that industry's interface with universities, community colleges, and technical schools leaves much to be desired, and that the private sector itself is chiefly responsible for this situation. It is therefore urged that appropriate steps be taken now by industry, in conjunction with government, to improve industry's relations with the educational community. Only increased interaction between industry and the education system can help to ensure that future manpower demands will be known and satisfied so that supply bottlenecks do not develop.

DESIGN AND ENGINEERING

While the Advisory Committee has addressed only those issues directly and indirectly related to industrial R & D, the Committee is cognizant of the need for incentives affecting other elements of the innovative cycle, since industrial R & D must be commercialized to bring about an economic payoff. Specifically, design and engineering must keep pace with research and development. However, at present the gap between Canada and the United States in design and engineering is even larger than the gap in R & D. Thus the Committee strongly recommends that incentives for design and engineering commensurable with those suggested for R & D be given serious consideration.

APPENDIX I

Press Release:

from the Minister of State

for Science and Technology

the Hon. Judd Buchanan,

1 June 1978

SUPPORT FOR INDUSTRIAL RESEARCH ANNOUNCED BY THE HONOURABLE JUDD BUCHANAN

OTTAWA -- Measures to stimulate industrial research in Canada, to create jobs for scientists, engineers and technicians, and to provide additional support for university research were the highlights of a major announcement in the House of Commons today by the Honourable Judd Buchanan, Minister of State for Science and Technology.

In announcing a new national priority for research and development, Mr. Buchanan stressed that the government would strengthen industrial research efforts through the tax incentives already announced, through direct assistance, through changes in government procurement policies, by encouraging Canadian industry to take advantage of the results of research conducted by university and government scientists, and through close consultation and collaboration with the provinces.

Total cost of the new measures will be $28.7 million in fiscal year 1978-79.

Included among the measures announced by the Minister were:

- a national target for R & D expenditure of 1.5 per cent of Gross Domestic Product by 1983
- the use of government procurement practices to support Canadian industrial research and industrial development in Canada
- expansion of government contracting-out policies by adding $1.5 million in each of the next two years to the Unsolicited Proposals Fund of the Department of Supply and Services which is designed to allow industry to meet government research needs
- a $3 million program under Canada Works to create jobs for scientific and technical personnel to undertake research projects in universities at the request of Canadian firms. This complements the science and technology employment program (STEP) in industry announced in April
- the addition of $5 million to the National Research Council's Program of Industry/Laboratory Projects (PILP) and the extension of the program to other departments
- expansion of $350,000 of the NRC's Technical Information Service for small businesses through the employment of senior students in science and engineering
- Canadian Patents and Development Limited to act as a

clearing house between industry and government to facilitate the transfer of technology

- establishment, over the next two years, of up to 5 regional university-based Industrial Research and Innovation Centres (IRIC) with $2 million being made available this year
- creation of Centres of Excellence on a regional basis to achieve better integration of government, university and industrial research capacity that will be based on the natural and human resources of each area
- an increase of $10 million this year in the budgets of the granting councils for university research in areas of national concern.

In announcing the measures, the Minister also tabled in the House a document entitled, Research and Development in Canada: A Discussion Paper. The paper deals with long-term issues and policies in science and is being released to stimulate an exchange of views among the research sectors prior to the proposed Federal-Provincial Conference on Industrial R & D in the fall of 1978.

Mr. Buchanan said that a strong R & D effort in Canada is an essential component of success in an international trading environment which is becoming increasingly competitive. The Minister added that the measures "would lay a good foundation for growth in industrial R & D and for a new spirit of cooperation among government, universities and industry."

APPENDIX II

NEW PRINCIPLES OF INTERNATIONAL BUSINESS CONDUCT

Foreign-controlled businesses in Canada are expected to operate in ways that will bring significant benefit to Canada. To this end they should pursue policies that will foster their independence in decision-making, and their innovative and other entrepreneurial capabilities, their efficiency, and their identification with Canada and the aspirations of the Canadian people.

Within these general objectives, the following principles of good corporate behaviour are recommended by the Canadian government. Foreign-controlled firms in Canada should:

1. Pursue a high degree of autonomy in the exercise of decision-making and risk-taking functions, including innovative activity and the marketing of any resulting new products.
2. Develop as an integral part of the Canadian operation an autonomous capability for technological innovation, including research, development, engineering, industrial design and preproduction activities; and for production, marketing, and purchasing, and accounting.
3. Retain in Canada a sufficient share of earnings to give strong financial support to the growth and entrepreneurial potential of the Canadian operation, having in mind a fair

return to shareholders on capital invested.

4. Strive for a full international mandate for innovation and market development, when it will enable the Canadian company to improve its efficiency by specialization of productive operations.

5. Aggressively pursue and develop market opportunities throughout international markets as well as in Canada.

6. Extend the processing in Canada of natural resource products to the maximum extent feasible on an economic basis.

7. Search out and develop economic sources of supply in Canada for domestically produced goods and for professional and other services.

8. Foster a Canadian outlook within management, as well as enlarged career opportunities within Canada, by promoting Canadians to senior and middle management positions, by assisting this process with an effective management training program, and by including a majority of Canadians on boards of directors of all Canadian companies, in accordance with the spirit of federal legislative initiatives.

9. Create a financial structure that provides opportunity for substantial equity participation in the Canadian enterprise by the Canadian public.

10. Pursue a pricing policy designed to assure a fair and reasonable return to the company and to Canada for all goods and services sold abroad, including sales to parent companies and other affiliates. In respect of purchases from parent companies and affiliates abroad, pursue a pricing policy

designed to assure that the terms are at least as favourable as those offered by other supplies.

11. Regularly publish information on the operations and financial position of the firm.

12. Give appropriate support to recognized national objectives and established government programs, while resisting any direct or indirect pressure from foreign governments or associated companies to act in a contrary manner.

13. Participate in Canadian social and cultural life and support those institutions that are concerned with the intellectual, social and cultural advancement of the Canadian community.

14. Endeavour to ensure that access to foreign resources, including technology and know-how, is not associated with terms and conditions that restrain the firm from observing these principles.