



SUSTAINING A RENEWABLE RESOURCE

Dr. Art Olson, CFBS Executive Director
Dr. Bruce Sells, CFBS Executive Director-Emeritus
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CANADIAN FEDERATION OF BIOLOGICAL SOCIETIES:

The Canadian Federation of Biological Societies (CFBS), representing 12 national Life Science organizations with members from industry, government and academic sectors, was founded in 1957. Its purpose is to promote forward-looking science policies and to show case Canadian life sciences research through scientific conferences. CFBS is supported financially by income derived from the scientific meetings, by funds provided by each member society and contracts for services to societies.

Overview:

Canada's continued productivity depends on the availability of highly qualified personnel, investment and cooperation. Recent investments by the Federal Government, some provincial governments and some private sector interests have improved Canada's ability to attract and retain outstanding scientists. At the same time, however, similar and even larger investments in research are being made by many of our international competitors as they too realize that their future depends on technology. If Canada is to remain amongst the top countries involved in innovation, carefully crafted and forward looking policies must be devised and supported over long enough periods to ensure that we have highly qualified personnel, attractive research environments and time to harvest value from the research dollars invested.

RECOMMENDATIONS:

- 1) Accelerate the evolution of Canada's science and technology framework.**
- 2) Continue to develop and acquire highly qualified personnel.**
- 3) Sustain the investment.**
- 4) Maximize return from research investment.**

INTRODUCTION

Canada's economy continues to be based primarily on non-renewable resources in oil, gas and minerals. Other countries recognize this potential but unless multinational companies establish head offices in Canada, we are not likely to see their investment in research happen here. Our natural resources have provided us with a high standard of living; however, we must be more productive and effective in creating value-added products. To achieve this goal, ensuring commitments to growing our most renewable resource - creative people - must be sustained.

Our future economic and social development depends on Canada's continuing to value innovation and our reputation as a country with intellectual and creative resources. Over the last decade, large investments in publicly funded research have resulted in both retention as well as an influx of bright minds from other countries. In fact, among the G-8 nations, Canada leads, in public research support. Unfortunately, Canada's corporate community has not made the same investments in research. The Federal Government's expressed concern over the lack of research carried out in Canada by both Canadian and foreign companies doing business in this country led to the Report of the Expert Panel on Commercialization¹ which suggests encouraging development and access to highly qualified personnel that can deliver the needed individuals to create and produce new products in an efficient manner. In fairness, Canada's history of commitment to innovation over the past 50 years has, at times, been spotty and, therefore, we need to demonstrate that this nation is serious in sustaining the presence of an intellectual/creative resource.

The following "brief" and its recommendations are suggestions to ensure an environment that will help government achieve these desired goals.

RECOMMENDATIONS:

1) Accelerate the evolution of Canada's science and technology framework

We recommend placing greater urgency on the development of a national S&T framework. This initiative is being led by Industry Canada in collaboration with the Department of Finance. We are concerned that the longer this process takes, the less likely it is that Canada will retain the brightest and the best personnel, the confidence of industry and such leadership as we currently have. In addition, we are concerned that a narrow focus on benefits to industry will damage the underpinning of Canada's scientific effort, basic research as well as areas outside of the interests of Industry Canada, for instance, health, environment and defence.

2) Continue to develop and acquire highly qualified personnel

Highly qualified personnel are a mobile resource and thus require assurance that their capabilities can be effectively utilized. Canada is currently seen as "a place to do research", a significant accomplishment but one that continues to be challenged by the investments by other industrialized countries in searching for new ideas and individuals who can contribute to that search. The emergence of India and China as global competitors and their investments in postsecondary education with the intent of changing their economic base has put additional pressure on the pool of creative scientists. The consequence of this initiative is that these sources of talent are drying up. Considering the changing landscape Canada cannot be complacent and must continue to encourage research-minded individuals and corporations to come to this country.

"...it is indisputable that a strong educational system is needed to foster innovation."¹ To ensure a continuous supply of creative personnel, the institutions that train/educate the next generation of our research community must be attractive places to work. Universities must possess the necessary up-to-date infrastructure that will allow the university faculty members to offer the best possible education/training for the next generation of scientists. CFBS appreciates that the primary responsibility for education lies with the provinces and that a dialogue has

been initiated on how best to provide support to this system. We support these discussions and the development of a more transparent system for tracking how transfers are used. The operating budgets of universities have dropped significantly over the past two decades with these institutions having difficulty in providing the highest quality educational experience. Measured in constant dollars, grants to universities have declined by about 19% in the decade leading up to 2001. This is not solely a provincial problem. The Department of Finance's data indicate a 40% decline in federal cash support for post secondary education between 1992 and 2004 including a 9% drop in full time faculty between 1992 and 2002. This translates into a loss of almost 3500 scientists thus far with the problem compounded by the expected 10,000 retirements coming over the next decade. The federal initiative of establishing 2000 Research Chairs has been extremely welcome. Continued support for programs such as the Canada Research Chairs would relieve the financial pressures on universities and provide an environment that allows more effective interactions between students and professors.

Canada must encourage students to achieve their maximum potential - without creating major financial impediments. Exempting the first \$10,000 of student scholarship or bursary from taxation and providing students or their parents with a federal tax credit on spending up to \$500 per year on textbooks are welcome changes. The impact of tuition increases and other costs, however, is skewing attendance away from middle and lower income groups. The debt load carried on graduation by students and in particular on middle class parents appears to be compromising the incentive to enter graduate school and thus the capacity to meet Canada's future needs for highly qualified personnel.

Encouraging scientists to establish and stay in Canada is key to ensuring our business community has highly trained individuals and the immediate access to scientific competence they require. For those scientists with entrepreneurial skills, the venture capital environment that is essential to exploit new discoveries and technologies is inadequate.

3) Sustain the investment

Investments by the Federal government and some provinces have been successful in making Canada into an "innovative society". Investments in the life sciences area, as an example, created opportunities for rapid growth of the biomedical industries in this country. Recently announced commitments to support research related to cancer, mental illness and heart disease will further strengthen our abilities.

a) Statistics Canada estimates 2006 expected investment in research at about \$28.4 billion³. Research support in the past has gone through boom and bust cycles. Consistent investment is essential as exceptional researchers are an increasingly mobile resource. Sustaining the research enterprise will also communicate to the corporate sector Canada's ongoing commitment to innovation.

b) With the increased world-wide investment in research and creative individuals Canada's ability to attract and keep highly qualified personnel depends to a large extent on continued support for the federal granting agencies. The Canadian Institutes for Health Research (CIHR) and the National Science and Engineering Research Council (NSERC) have both reached the stage where their allocations are fully committed. Without additional resources, their options are to either cutback on existing commitments or limit the number of new researchers they support with

consequences for developing areas such as nanotechnology, environmental studies, biotechnology and novel diseases.

c) CFBS applauds the Governments recent announced increase to the indirect costs program. This program has been beneficial to universities and to research institutes. A transparent reporting mechanism is essential to ensuring that these funds are spent for the purposes designated.

d) Creation of the Canadian Foundation for Innovation (CFI) has resulted in huge benefits in the needed development of research infrastructure and has been a major attraction in recruiting outstanding scientists to Canada. At the same time, this program also places considerable pressures on granting agencies to contribute to equipment maintenance and other costs after the first 3 year phase of operation. Closer working relationships between the granting councils and other federal research efforts would be of value.

e) A significant research capacity exists within the Federal Government. This expertise is essential to ensuring that the Government has the best and most current advice available to it in dealing with major challenges such as infectious disease, environmental issues, energy, product safety and national security. While these capabilities exist within the public service; they require financial support, an effective peer review system and re-investments in physical infrastructure to be successful. Recruiting the most creative scientists will be enhanced by an attractive research environment.

4) Maximize return from research investment

a) Canadian taxpayers expect that their investments be closely monitored and managed efficiently.

i) Informed research decisions:

(1) Decisions on where future investments should be made requires a broad understanding of where we are at, where we have been successful and an appreciation of future opportunities. An ability to balance competing interests requires structures that encourage co-operation and coordinated response. Options include a return to a central agency approach, strengthening the Science Advisor's role or utilization of vehicles such as the Council of Canadian Academies to bring balance and coherence to Canada's research investments.

(2) Rigorous peer review, while not a perfect process, is an effective means of distinguishing potential. Such reviews are an ongoing challenge, as science evolves into new patterns requiring integration and breadth of understandings. Reviews involving international competence are an effective means of raising the bar.

(3) Funds allocated through cost sharing or indirect costing arrangements require commitment and subsequent audit to ensure accountability.

ii) At the same time, administrative roadblocks should be reduced. For instance, the granting agencies receive their funding on a year by year basis and must spend the allocation prior to the end of the fiscal year as there is no allowance for carryovers.

As support provided by the granting agencies to researchers is normally about 4 years in duration, should new funds not be provided to the agencies in any particular year, the only funds available for disbursement result from turn-over of support awarded 4 years earlier. With this in mind, we suggest that the granting agencies be allowed to carryover funds and that allocations be escalated over a 3 year period to allow for this forward planning and hence more efficient use of funds. Similar problems occur when federal departments agree to share research efforts. It is our understanding that precedents exist for such carry-overs.

b) Review co-funding:

(1) **"...many components of Canada's commercialization system are functioning well, and these should be re-inforced."**¹ **"...but commercialization of research lags compared with that in the United States in many areas."**² The Rotman report¹ recommends a superfund to address key commercialization issues and expansion of resources available to new firms. These recommendations have merit but the current plethora of co-funding programs and consequent arrangements requires analysis and integration. As well, peer review should be implicit in any science related decision process.

(2) Co-funding that requires support from provincial research agencies has been resisted by many provincial governments as intrusive. As well, ability to contribute varies considerably. As a consequence, excellent proposals can be denied because of the absence of appropriate partners. A closer working relationship between the two levels of government is essential.

Prepared by:

Dr. Art Olson, CFBS Executive Director

Dr. Bruce Sells, CFBS Executive Director-Emeritus

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2 Kevin Lynch "Canada's Success Is No Accident, And It Isn't A Given", Policy Options, Page 12, April-May 2006

3 Statistics Canada – Total spending on research and development in Canada, 1990 to 2006, and provinces, 1990 to 2004. Catalogue 88-001–XIE / ISSN1209-1278, Vol. 30, no.7

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