

What's fundamental about a fundamental science review?

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"We suggest that government funding of basic research should emphasize quality rather than quantity, that the social sciences, multidisciplinary efforts, and projects relevant to Canadian needs should get higher priority, and that the peer system should be improved."

No, this is not the initial recommendation from the Naylor advisory panel now reviewing fundamental science, but it could be. Rather, the quote is from the concluding volume of the Senate Special Committee of the Senate on Science Policy in 1977 (otherwise known as the Lamontagne Committee).

The current Liberal government has made a point of stating they believe investments in scientific research, including an appropriate balance between fundamental research and the commercialization of ideas, will lead to good jobs and sustainable economic growth.

The mandate letter of the science minister states she is to examine options to strengthen the recognition of, and support for, fundamental research to support new discoveries. In response, she has recently appointed a high-powered advisory panel to review federal support for fundamental science. It has two basic questions:

- Are there any overall program gaps in Canada's fundamental research funding ecosystem that need to be addressed?
- Are there elements or programming features in other countries that could provide a useful example for the Government of Canada in addressing these gaps?

Consultations are underway and a report is expected by end-of-year.

As the Lamontagne quote suggests, this is not a new effort. One could also table the principles of the National S&T Policy of 1987, wherein a key action item was to examine the state of basic research in Canada; or the 1994 Federal Science and Technology Review which included an assessment of several key policy issues including the advancement of knowledge. It asked what is the current federal activity in advancing knowledge; does it form a coherent strategy and what changes need to be made to the federal S&T investment to achieve priorities and strategies? Then there is the 1997 report by the House of Commons Standing Committee on Industry — Review of Science and Technology and the Innovation Gap in Canada. One could go on.

The point is not that these are mere technocratic-governance questions that keep surfacing (which they are), all in different political and temporal eras. Rather, we need to constantly reappraise support of knowledge to ensure it is in tune with the times; meets global standards; keeps up with the changing nature of science; and has the necessary support and leadership it requires — public, political and otherwise.

Going even further back, a 1972 Science Council of Canada, *Policy Objectives for Basic Research in Canada*, enumerated a series of 13 answers to familiar questions about basic research, including:

What are the major impediments to improved effectiveness of basic research in Canada? Is it better to support individuals, teams or institutions? What should be done to improve communication between scientists and taxpayers? What criteria should be used for the distribution of basic research effort among the three social sectors — higher education, government and industry? How should one integrate the use of research to produce new knowledge to develop human expertise?

In this latter area they argued that special attention will have to be paid to developing a more flexible attitude toward future work among those higher-level graduates with intensive training in research. As more and more of them will have to look for a career outside the university, provisions are needed for developing their ability to generalize their experience in research, as a preparation for work other than basic research.

The report goes on to ask: Which mechanisms for the public funding of basic research are most effective? It noted that there was no explicit mechanism for supporting transdisciplinary research, particularly when it should involve natural, health and social sciences together. In fact, it was necessary to approach separately several agencies, which then would have to reach an agreement on simultaneous funding. The SCC did note a new Tri-Council Coordinating Committee being set up as a unit within the National Science Library of the NRC.

This 1972 report was written well before the creation of today's three existing granting councils. And the larger programmatic landscape that has built up around them has made it a challenge for anyone to describe what Canada's research system actually looks like and how effectively it works, let alone to our partners internationally.

But almost 45 years ago, it is worth noting that the SCC report, after looking at the global research arena, also indicated main opportunities where Canada could do better; for example:

- a) more concentrated effort in fewer areas of investigation to develop centres of strength with a greater degree of world leadership;
- b) more emphasis on quality everywhere:
- c) better coordination of effort and more cooperation among individuals and small groups;
- d) improved communication among researchers in different disciplines and among those in different sectors;
- e) increased emphasis on problem areas of national or regional priority; and,
- f) closer two-way interaction between basic and applied research or development.

These themes still resonate today — they continue to be fundamental — and there are others. For example, maintaining a basic capacity for research training; providing a base of advanced knowledge and encouraging excellence in research.

Ultimately, however, we should remember a much more fundamental question about the rationale for basic research. Gerhard Herzberg, Nobel Laureate in chemistry, made the point well in 1965 when he said: "The other reason for support of pure science by government funds is that scientific research of the purest kind is an intellectual activity which, just like art, music literature, archaeology, and many other fields, helps us to understand who we are, what is the nature of the world in which we live."

The newest assessment underway should also not forget this in underscoring why fundamental science remains a lifeline for this country's future.

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