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# *A Parliamentary Career for Scientists and Engineers*

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by Marie Lavoie and Emilia Barbu

*While the House of Commons agenda is overwhelmed by science and technology crises, scientists and engineers are practically absent from this institution. This article suggests that while it is difficult to pinpoint the reasons behind their absence, political parties and universities have a role to play in encouraging these specialists to get involved. They should develop a proactive strategy to influence the participation of scientists in parliamentary life.*

Scientific and engineering expertise is at the core of economic growth, and it is vital for resolving the most complex issues faced by countries in recent years. In Canada, diverse crises have been particularly acute, threatening the population's public health and safety and raising deep concerns about the government's ability to act quickly and precisely. From one nuclear crisis to the next—as well as problems related to public health, climate change, environment, drug safety, bioethics, and biodiversity—complex challenges requiring solutions from experts in science and technology must be addressed in the new global landscape.

Trapped in the midst of all these crises, there does not seem to be anyone to whom we can turn for advice and expertise in the House of Commons. In fact, science and technology expertise has always been under-represented in Parliament except for physicians who have been consistently in the top ten occupations represented in the House of Commons over the last 50 years. Very few elected officials have a basic understanding of the science and technology method and mindset. However, the low number of these specialists is not specific to Canada; there has been an outcry for more scientists and engineers in the White

House as well as in many European countries. The new American administration received clear direction through President Obama's inaugural speech, which affirmed that, "we'll restore science to its rightful place...." Millions of dollars have been announced to support research while top Canadian scientists are leaving due to the funding crunch in science and pursuing attractive opportunities in the United States.

Reacting to major scientific and technological disasters is not the experts' only (or even most important) role. As innovation is the engine of economic growth, they play an important part in transforming technological and scientific opportunities into economic growth, which then results in economic and social well-being. In the midst of an economic crisis, scientific and technological capacity plays a critical role. Without this expertise, modern society and economic growth would not be possible.

For many years, scholars have been recommending that we guard against shortsighted investment. They have also strongly recommended that firms and countries invest in innovation not only to remain competitive, but to reduce costs, provide treatment for incurable diseases, and prevent crises. Investment in science and technology requires a long-term political perspective, leaving no room for stop-and-go policy. Constant inflow of new money is vital, especially when we are facing significant and increasing international competition. Science and technology labour markets are porous and experts in these fields will go wherever the money is.

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## **A Plea for Science and Engineering Expertise in the House of Commons**

Of greater concern is the difficulty to pinpoint why these specialists rarely consider politics as a career. Is it related to their pattern of professional development? Or do they consider politics to be a messy business? Although their work is often oriented to things and facts (rather than people), these experts basically hold our lives in their hands.

Given the centrality of science and technology in economic growth, and considering the prevalence of recent crises, these issues fill a large part of the agenda in the House of Commons. The expertise of the scientific community is required to identify, diagnose, anticipate, and even prevent crisis, as well as develop sound policy, support decisions, and encourage actions that bring rapid solutions. Their capacity to choose the right priorities is required more than ever in a context of scarce resources; their facts-based approach is also crucial in modern economy and society. They have a greater role to play in convincing policy-makers about the usefulness of scientific and technological change, the level of risks involved in scientific discoveries, the anticipation of changes in different fields, and so on.

Suffice it to say that political leaders must do more than recognize problems. They must also possess the goodwill to provide solutions to these problems. As such, they must be surrounded by experts able to provide solutions. These experts must make sure that diagnoses are well-established on facts, and that causes of a problem are correctly identified and solutions are realistic. In the case of problems involving science and technology, the debating table must include the expertise of scientists and engineers from different fields to discuss how potential solutions would materialize. A variety of experts within the science and technology fields must be involved, as debates are not always black and white; they are often extremely nuanced and even fiercely controversial. Those in favour of a position as well as its opponents must be heard. Of course, some advice can be exercised outside Parliament. Different advisory arrangements could offset the absence of scientists and engineers in the House of Commons. However, the recent removal of Canada's National Science Advisor leaves plenty of room for the urgent involvement of this community.

The role of a parliamentarian in the House of Commons is to represent and govern. The act of representing and governing requires a balance between defending specific citizens' interests and supporting the collective well-being.<sup>1</sup> Increasingly, social, human, and economic well-being are threatened

by breaches in parliamentarian expertise as a whole. Today's politics cry out for the participation of science and technology experts. However, there is a feeling that this community is disconnected from politics and this belief is strongly supported by the reality of the House of Commons in Canada. Given the magnitude and urgency of problems facing Canada and most industrialized countries, there is a need to bridge the gap between science and politics.

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## **Representation**

Representation is fundamental to democracy. There can never be a perfect correspondence between representatives and their constituents as per sex, age, social conditions, experience, and expertise.<sup>2</sup> Although a match is not vital, the quality of representation is fundamental and cannot be gauged uniquely on the basis of mathematical equity. Indeed, the profile of deputies affects the way the government plays its role. However, Parliament cannot represent all groups of individuals. The high incidence of lawyers and the low representation of science and technology in the House of Commons is not a recent phenomenon. Over time, lawyers have been the most weighty occupational group represented though slightly decreasing since the 33rd legislature, as shown in Table 1. This long-term association can be explained by the congruence between politics and law.<sup>3</sup>

Engineers, more particularly, have modest representation, accounting for approximately 2 to 3 percent of total members of Parliament. On only two occasions in the 33rd and 39th Parliaments have engineers reached about 4 percent of total representation. In absolute numbers, this represents about ten engineers for each legislature. Still more worrying is the fact that, from the 34th Parliament onward, only one or two professional (licensed) engineers have held a seat in the House of Commons.

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## **Government**

The act of governing refers to the capacity of a government to solve problems and promote better standards of living, reach high levels of health, and ensure safety and public security for all constituents. This capacity is strongly affected by the quality of representation. In the wake of near panic in Canada over recent crises, such as the Severe Acute Respiratory Syndrome (SARS) epidemic in Toronto, the lysteria burst, and the problem of supplying medical isotopes (radioactive atoms), all these issues received inadequate weight in the public as well as within private governance spheres. Good policy decisions regarding these issues must be made quickly and be

**Table 1  
Representation of Occupations by Parliament**

Parliament	Lawyer %	Farmer %	Economist %	Professor %	Teacher %	Engineer %	Physician %	Total Members*
40th	15.9	7.1	1.6	6.1	8.4	2.9	1.3	308
39th	15.4	6.3	2.5	6.9	9.1	4.1	1.3	317
38th	14.2	7.1	2.5	8.1	11.0	2.9	1.3	309
37th	13.4	7.0	2.5	6.7	14.0	1.9	2.5	313
36th	11.6	7.1	2.2	9.0	15.4	2.2	2.2	311
35th	15.8	8.9	3.6	10.5	16.4	2.0	2.0	304
34th	19.3	5.7	1.7	7.3	14.0	2.7	1.7	300
33rd	19.1	8.7	2.4	7.6	9.7	4.2	1.7	288
32nd	24.6	7.2	2.0	9.5	9.9	3.1	1.4	293
31st	24.6	7.7	2.1	7.7	10.2	2.8	2.1	284
30th	23.9	6.6	2.8	7.3	10.4	2.1	3.1	288
29th	24.2	7.6	2.3	6.1	10.1	3.0	2.6	264
28th	24.4	9.4	4.0	7.3	7.6	3.6	1.8	275
27th	23.3	13.8	3.3	5.1	6.9	2.5	2.5	275

\* Total number of members varies due to vacant seats having been refilled by a new member after a by-election at the time of data compilation. Percentages have been rounded to the nearest percentage point.

Source: Our own computations based on data from the Parliament of Canada website: <http://www.parl.gc.ca>

informed by sound scientific knowledge.

When it comes to scientific concerns, debating means trying to solve problems with a high level of complexity and uncertainty, involving risks that must be identified and managed. Deficits in risk governance can be devastating for a government given the potential consequences affecting public trust. In contemporary economy and society, regulation and the enforcement of standards have become necessary.

On the other hand, governing involves choice and making decisions about where limited resources should be invested. On the energy issue, for example, there is a divergence of interests that must be solved. Increasing fuel economy standards could jeopardize the automakers but, for the sake of our planet, it requires an enlightened discussion. With the increasing need of a global response and expertise from the scientific community, it is quite worrying to consider the absence of these experts in the House of Commons. Few science-related issues have received constant or long-term attention. It seems that the scientific community is sought out only when a crisis is imminent.

Debating is the principal tool of parliamentarians and must take place in an informed way. The involvement

of engineers and scientists can change the way debates are held. Their strength of persuasion is based on their methods of problem-solving, mathematical reasoning, quantitative skills, and perception and representation of science and technology reality as applied to economy and society. Of course, they must be held accountable as any other member of the House of Commons. They could also become outside advisors and contribute to debates. However, being part of Parliament would provide a daily reminder of the omnipresence of science and technology in our lives and would help to keep a careful eye on its development.

Setting the priorities in a context of scarce resources is probably one of the most difficult problems to resolve. The role of these specialists is fundamental to economic growth as they are the core players in the innovation process and in research and development (R&D) activities. As the rates of return on R&D investment far exceed the rates of return on physical capital investment, it is easy to understand why a choice must be made toward R&D. However, both types of investment are complementary and a balance must be achieved. In addition, the specificity of R&D is also fundamental for the rate of return, as basic research has a higher rate of return than applied research or development. As fundamental research

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is publicly funded in Canada, the last federal budget (which focused on infrastructure) left a big hole in the core R&D activity.

### **Getting at the Root of the Problem**

Why does the scientific community not show any interest in the parliamentary life? Is there as much divergence between science and politics as there is congruence between law and politics? Between pragmatism and ideology? Even though economists tend to explain the attractiveness of a specific career on the basis of salaries, data reveal that, in this specific case, salaries would be an incentive for engineers and scientists to enter a parliamentary career. In the specific case of engineers, according to a survey carried out by the Ontario Society of Professional Engineers, in 2004 the average salary of an engineer with more than three years of work experience was about \$87,000, whereas the basic salary in 2009 for a Member of the House of Commons is about \$158,000 (<http://www.parl.gc.ca>). The high scale of salaries offered to parliamentarians forces us to look for other reasons.

The short-term nature of a career in the House of Commons—compared to a long-term, path-dependent science and technology career—is certainly an obstacle. One cannot re-enter the science or technology field without some opportunity cost, contrary to (for the most part) social science specialists or lawyers for whom a parliamentary career would be an efficient springboard improving their career opportunities.

Another point worth emphasizing is that accessing the Cabinet for these specialists does not depend only on education, merit or promotion. Being the exclusive prerogative of the Prime Minister, the ability to reach the top of the House of Commons job structure can be influenced by ethnicity, loyalty to leader, gender or any other number of factors that are neither a priority nor an interest for scientists and engineers. This lack of interest is based upon the findings of a study comparing personality characteristics that suggests that engineers are rather solitary birds.<sup>4</sup> Political life in Canada is organized around political parties instead of individual politicians, which is quite incompatible with the character and career of science and technology experts and could lead to career disappointment and frustration.

Beyond Parliament, other institutional arrangements can influence career choices, such as electoral system and political parties.<sup>5</sup> It is therefore not particularly easy to pinpoint the determinants of a parliamentary career for people in general, and for these experts in particular.

### **What Kind of Incentives?**

A proactive strategy should be urgently undertaken to encourage the scientific community of varied academic backgrounds to enter a career in the House of Commons. Incentives to attract scientists and engineers rest on both the supply and demand sides of the market. On the demand side, political parties must be able to attract candidates with scientific and engineering backgrounds. If salaries are not a barrier, then political parties should use a proactive strategy to recruit these specialists to become candidates for election.

Engineers Canada (the former Canadian Council of Professional Engineers) made a step forward in that direction and developed a program *Bridging Government and Engineers* to bring together engineers and their local federal member of parliament. Based on voluntary participation of the engineering community, the program aims at involving engineers in public decision-making.

On the supply side, universities have an important role to play in making graduates increasingly aware of the relevance of their knowledge and expertise in Parliament. This leaves information about a parliamentary career to be a crucial tool. It is more important than ever that universities provide information and education reflecting the reality faced by science and technology challenges and help to devise sound policy.

This can involve initiatives allowing scientists, physicians, and engineers to develop a taste for politics through fellowships such as the Robert Wood Johnson program, as well as several others like the ones sponsored by scientific societies in the United States.

Parliamentary internship programs—such as the Jean-Charles Bonenfant Foundation at the National Assembly in Québec and the House of Commons in Ottawa—should publicize these internship programs in university science and engineering departments. Students in these disciplines are often not aware of their potential contribution to politics. These programs could help matching interests in politics for science, engineering or health specialists.<sup>6</sup>

Interpersonal skills have been identified as being the weakest asset of engineers in their career when compared to social science experts. If this is really the problem, training programs in interpersonal skills should be provided to overcome this weakness and help them to become more proficient in communication, ethics, and leadership. Finally, as was the case with introducing management of technology

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(MOT) specialization in the curriculum of engineering programs to offset their weakness in management (especially in the commercialization of their discoveries from the laboratories to the marketplace), it would be more than welcome to add policy background to science and engineering programs given the huge contribution these specialists are going to make to the challenging issues currently faced by the economy and society.

### Conclusion

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Raising the question of the relationship between science and politics is not new. In 1942, *Nature* published an article in which they underlined the responsibility of scientists and engineers in the field.<sup>7</sup> Attracting the scientific community to the political process by entering a parliamentary career would give credibility and a lot of clout to Parliament. This is a call to scientists and engineers to participate in the parliamentary process and erase the “messy business” reputation of politics. Several contemporary political issues are closely related to science and technology, so rehabilitating Parliament would ensure that these complex problems can be identified and ultimately solved as soon as society faces them. However, the neutrality of scientists (as for others) cannot be taken for granted. Self-interest can influence the direction of research as much as policy. Science is not synonymous with objectivity and disinterest. While we need to remain vigilant against politics driving science, it is also important to stay vigilant against science driving policy.<sup>8</sup> In other words, the two paradoxes raised by Weingart about

the “simultaneous scientification of politics and the politicisation of science”<sup>9</sup> are still present but must be overcome given the crises threatening public health, environment, and society.

### Notes

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1. See C. St-Hilaire, Can Parliament be Reinvented? *Canadian Parliamentary Review*, vol. 25, no. 4, winter, 2002-03.
2. See M. Lavoie, and V. Lemieux, The Evaluation of Electoral Systems, *Canadian Parliamentary Review*, vol.6, no.4, winter, 1983.
3. A. Kornberg, and H.H. Winsborough, The Recruitment of Canadian Members of Parliament, *American Political Science Review*, 1968, p 1248.
4. H.T. Van Der Molen, H.G. Schmidt, and G. Kruisman, Personality Characteristics of Engineers, *European Journal of Engineering Education*, vol. 32, no. 5, October, 2007, pp. 495-501.
5. M.M. Atkinson, and D.C. Docherty, Moving Right Along: The Roots of Amateurism in the Canadian House of Commons, *Canadian Journal of Political Science*, vol. XXV. No. 2, June, 1992, p. 318.
6. Eugene Russo, “Putting Politics back into Science”, *Nature jobs – Special Report*, Vol. 415, No. 6874, February 21, 2002, pp. 4-5.
7. *Nature*. Relation of Science to Politics, vol. 149, no. 3775, March 7, 1942, pp. 253-255.
8. D. Overbye, Elevating Science, Elevating Democracy, *The New York Times*, January 27, 2009.
9. P. Weingart, Scientific Expertise and Political Accountability: Paradoxes of Science in Politics, *Science and Public Policy*, vol. 26, no. 3 June, 1999, pp. 151-161.