

## **Foreword**

With the October 19, 2015, federal election looming, the CJC has been fortunate to receive a submission from two McGill colleagues dealing at some length with the federal Conservatives' "War on Science." Probably no other issue, except perhaps the Oil Sands, has received as much commentary from sources all over North America and Europe regarding the policies of the Harper government's muzzling of government scientists, as well as cuts to federal scientific agencies. Yes, there have been cuts; yes, the priorities of federal science policy have been modified; and yes, this is perfectly consistent with the agenda of a neo-liberal government, as Amend and Barney detail in their impressively balanced account. But, as they note, these shifts by no means amount to the evisceration of federal science that many others have alleged.

In the interests of democratic debate, we have gone online with an advance version of the article, to time it with the remaining days of the electoral discussion. Amend and Barney's article is a timely and outstanding account of a hot topic, written with the calm of the very best policy scholarship. This preliminary version will be replaced by an online and print version in the spring issue of the CJC, as originally planned.

*Michael Dorland, Editor, Canadian Journal of Communication (CJC)*

## **Getting It Right: Canadian Conservatives and the “War on Science”**

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**ABSTRACT** Critics have paid considerable attention to the Conservative government’s record on science and technology. Cuts to funding and resources in these sectors, numerous environmentally-questionable policies, and charges of information control over Canada’s scientific community have served as evidence for many that Prime Minister Stephen Harper’s government and its supporters mobilize an “anti-science” ideology and are engaged in a “war on science.” However, the government has continued to make financial and rhetorical investments into science and technology to promote economic prosperity and boost Canadian national identity based on “innovation.” This article investigates the claim that Canadian Conservatives are “anti-science,” and asks whether this label is an adequate appraisal of the Canadian Right’s disposition toward science, or is beneficial to discussions on science and the public interest.

**RÉSUMÉ** Les critiques ont porté une attention spéciale à la fiche du gouvernement conservateur sur la science et la technologie. Les compressions budgétaire dans l’allocation des ressources dans ces secteurs, les nombreuses politiques douteuse portant sur l’environnement, et les plaintes de contrôle de l’information sur la communauté scientifique canadienne ont servi comme preuve pour plusieurs que le gouvernement du premier ministre Stephen Harper et ses partisans mobilisent une idéologie «antiscience» et sont engagés dans une guerre contre la science. Cependant, le gouvernement a continué de faire des investissements financiers et rhétoriques dans la science et la technologie afin de promouvoir la prospérité économique et de renforcer l’identité nationale canadienne fondée sur «l’innovation». Cet article examine l’allégation que les conservateurs canadiens sont «antiscience» et se demande si celle-ci est une évaluation adéquate de la disposition du droit du Canada envers la science, ou est bénéfique pour les discussions sur la science et l’intérêt public.

### **Introduction**

As 2014 came to a close, the editorial board at the *Toronto Star* (2014), Canada’s largest daily newspaper, reflected upon Canadian science policy and the “catastrophic course” it has taken under Prime Minister Stephen Harper’s Conservative government. Of primary concern to the editors was the turn away from basic research to application-dri-

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ven projects and commercially viable public-private partnerships that have “essentially transformed much of Canada’s research budget into a business subsidy” (*Toronto Star*, 2014). They split Harper’s critics into two camps: those who view the Conservatives as anti-science “cavemen set on dragging Canada into a dark age in which ideology reigns unencumbered by evidence” (*Toronto Star*, 2014), and those who believe the Conservatives “are not anti-science – that they at least understand the importance of research and development to their ‘jobs and growth’ agenda – but are instead merely confused about how the enterprise works and about the role government must play to help it flourish” (*Toronto Star*, 2014).

The “anti-science” charge has circulated widely in Canada since the Harper Conservatives took power in 2006 and allegedly began their “war on science” (e.g., *Death of Evidence*, 2012; Dupuis, 2013; Gatehouse, 2013; Turner, 2013). Those critical of their approach to science policy have used the expression as a discursive weapon to connote the Conservatives’ apparent hostility toward scientific evidence (e.g., Holmes, 2013; Linnitt, 2013), and locate the proof of this in major cuts to federal agency budgets and personnel, and strict media relations policies that “muzzle” scientists (Bell, 2012; Pedwell, 2012). A number of editorials and opinion pieces in mainstream journalism and scientific publications over the years have reprimanded the Harper government’s alleged anti-science approach, both in Canadian media (e.g., *Globe and Mail*, 2013; McKnight, 2012; *Toronto Star*, 2013) and on an international scale in publications such as *The New York Times* (Klinkenborg, 2013), *The Guardian* (Bell, 2012), *Nature* (*Nature* 2012a; 2012b), *The Scientist* (Douglas, 2013), and *New Scientist* (Holmes, 2013). Canadian journalist and former Green Party of Canada candidate Chris Turner (2013), also critically explores the Harper government’s record on science in his book *The War on Science*.

As is well known, the charge of “anti-science” gained currency in the 1990s in the context of the so-called “Science Wars,” in which various strains of critical thought associated with postmodernism, the sociology of scientific knowledge, and social studies of science and technology were accused of harbouring hostility toward (and undermining the authority of) scientific knowledge and the scientific method (Ashman & Baringer, 2001; Ross, 1996; Segerstrale, 2000; Sokal & Bricmont, 1998). Interestingly, in this case, those accused of adhering to or promoting an “anti-science” position were generally also identified as belonging to the “academic Left” (Gross & Levitt, 1994).

Trevor Pinch and Harry Collins (1979) identify three principle reasons a person or group’s beliefs may be characterized as anti-scientific: 1) they do not meet conventional norms of “legitimate” scientific knowledge; 2) they have not been established according to a method identified as “scientific”; and 3) the substance of the person or group’s beliefs are viewed as incompatible with, or contrary to, established scientific knowledge (pp. 223–224). Beyond this, “anti-science” has been used to denote a range of views including: skepticism about the universality of the scientific method and a belief that scientific practice and knowledge are culturally and historically situated; Romantic, “counter-Enlightenment,” philosophies that value intuition, passion, and organic connection to nature over “rational” scientific thought; and “pseudo-scientific” beliefs such as astrology or the “sciences of the paranormal” (Berlin, 2013; Holton, 1993; Nowotny, 1979; Pinch & Collins, 1979). More recently, the anti-science label has

been attached to the American Right, as factions within the Republican party have been accused (not without reason) of ignoring and contesting proof of global warming, denying evolution in favour of intelligent design, refusing access to reproductive technologies and medical procedures related to women's health, interfering in the science-based regulation of harmful industries, and waging their own "war on science," especially during the last Bush administration (Forrest & Gross, 2007; Mooney, 2006; Oreskes & Conway, 2011; Specter, 2006). Anti-science, it would seem, is both a promiscuous condition, and an equal opportunity epithet.

This article will deploy a combination of approaches—documentary analysis, political economy, and textual critique—to consider the claim that contemporary Canadian Conservatives are "anti-science." The Harper Conservatives' record clearly demonstrates a coordinated effort by the government to reduce the state's role in funding disinterested scientific research, the role of scientific advice in policy development, the authority of scientific evidence and agencies in regulating industrial activity, and the place of scientific information in the public sphere. However, alongside this activity, the government has made continued rhetorical and financial investment in scientific and technological innovation as both the key to economic prosperity and the defining element of Canadian national identity and purpose. Even as the relationship between capital, science, and the state has been rationalized, it has arguably become more intimate than it has ever been. Harnessing scientific knowledge and technological innovation to the imperatives of commercial productivity, economic growth, and global competitiveness is a signature motif of contemporary liberal-capitalist states, and one the Harper government has embraced. In this light, we will undertake a thorough consideration of the Canadian Conservatives' disposition toward science and consider whether the "anti-science" epithet is adequate. We will argue the "anti-science" label misdiagnoses the Harper government's political position concerning science and technological innovation, mischaracterizes the ongoing structural relationship between scientific knowledge and the political economy of the Canadian state, and invokes a conception of science that is no longer plausible in light of established understandings of the social production of scientific knowledge. In each of these respects, the discourse of "anti-science" has little to offer in support of a critical engagement with science and its place in Canadian society. In what follows, we hope to show it is possible to be critical of a particular political orientation toward science without resorting to arguments that reinstall an ideal of science as independent of the social and political conditions in which it participates.

### **The Harper Conservatives' science record**

Since the Harper government was elected in 2006, market orientations have loomed large—insofar as much of its activity in this area can be described as limiting the potential for scientific knowledge to be mobilized in support of constraining or regulating industrial and commercial development, particularly in the resource and energy sectors. At the same time, the government has acted consistently to orient what remains of Canada's public sector science capacity toward support for commercial and industrial development. As we detail below, the Harper government's measures in relation to science fall into three main categories: funding and personnel cuts, information

control, and structural adjustment. The accumulated effect of these activities has been to fuel the charge that the government is “anti-science.”

#### *Funding and personnel cuts*

In July 2012, members of Canada’s science community held a protest on Parliament Hill in response to what they called “the death of evidence.” The Ottawa rally demonstrated against a number of perceived “anti-science” moves the Harper government had made since 2006, including major budget and personnel cuts at federal agencies, such as Environment Canada, Fisheries and Oceans Canada, Statistics Canada, Library and Archives Canada, the Natural Sciences and Engineering Research Council (NSERC), and the National Research Council [NRC] (Bell, 2012; Death of Evidence, 2012; Gatehouse, 2013; Linnitt, 2013; Pedwell, 2012; Turner, 2013). In March 2008, the office of the National Science Advisor was closed when Arthur Carty, who was originally appointed to the post in 2004 by then Liberal Prime Minister Paul Martin, retired. At the time, members of the scientific community expressed worry the closure would also mean the loss of an ally in government, especially regarding funding and policy issues (CBC News, 2008; Linnitt, 2013).

In 2009, cuts affected three granting councils that provide money for scientific research at Canadian universities: the Canadian Institute of Health Research (CIHR), the Social Sciences and Humanities Research Council (SSHRC), and, again, NSERC (Canadian Association of University Teachers, 2013). Critics also point to *who* the Harper government has appointed to such granting agencies: Mark Mullins, a climate change critic and former executive director of the Fraser Institute, a conservative think tank, was appointed to the NSERC governing board in 2009, while John Weissenberger, another global warming skeptic, was appointed to the board of the Canada Foundation for Innovation, which provides funding for Canadian science research and technology development (Curry, 2009).

Another main focus of the “death of evidence” protest was the Conservative government’s May 2012 announcement that it would be shutting down the Experimental Lakes Area (ELA) in Northwestern Ontario to save approximately \$2 million annually. The facility and its 58 lakes and their catchments have provided scientists the opportunity for whole-ecosystem research since 1968. In May 2013, however, it was announced the ELA would in fact stay open under the management of the International Institute for Sustainable Development (IISD), an independent non-governmental and not-for-profit research organization headquartered in Winnipeg. Some opposition members claimed the decision was a sign the Conservative government was backtracking on its original cost-cutting “anti-science” plan for the ELA after widespread condemnation from the science community (De Souza, 2013; Galloway, 2013; Linnitt, 2013; Turner, 2013; Welch, 2013).

Other government-mandated cuts include the closure of the Polar Environment Atmospheric Research Laboratory (PEARL), announced in February 2012. Located in the high arctic, the lab monitors polar atmospheres and provides scientists opportunities for testing climate models. While PEARL’s funding was partially restored in 2013, scientists claim the funding interruption resulted in a significant loss of observation time and data (CBC News, 2012; Linnitt, 2013; Semeniuk, 2014; Turner, 2013).

Budget and staff reductions at the Department of Fisheries and Oceans, which began in November 2012, have also had a major impact on the department's biologists who are working on fish habitat protection for sockeye salmon populations in British Columbia, which have been in decline since the late 1990s (Hume, 2012; Linnitt, 2013; Turner, 2013). In summer 2010, the Harper government announced it would be scrapping Statistics Canada's long-form census for 2011, raising concerns within the country's scientific community (Linnitt, 2013; Scoffield, 2011; Turner, 2013). As *Vancouver Sun* columnist Peter McKnight (2012) writes, losing the information previously obtained by the long-form census "makes it difficult or impossible to study thousands of aspects of our natural and human environments, from the economy to health care to municipal design."

In addition to staff cuts, the elimination of specialist archivists, and the discontinuation of new acquisitions, the Harper government announced in 2012 that it would close down national Library and Archives Canada sites as it moved toward digitization. However, members of Canada's scientific community, many who depend on these library collections for their research, raised concerns that the dismantling has been rash and unorganized, resulting in the loss of fishery, ocean, and environmental libraries. These scientists have claimed that much archival and library material has been destroyed without being digitized, in what some have called "libricide" and indicative of a Conservative ideology marked by "fear and insecurity ... about how to deal with science and knowledge" tied to the Harper government's perception that environmental science threatens the unfettered exploitation of natural resources (Nikiforuk, 2013).

### *Information control*

Funding and resource cuts implemented by the Harper government are not the only actions restricting Canada's scientists. As recently as May 19, 2015, protests organized in Ottawa, Montréal, Québec City, and Vancouver by the Professional Institute of the Public Service of Canada (PIPSC), the Public Service Alliance of Canada (PSAC), and the Canadian Association of Professional Employees (CAPE) saw federal employees demonstrating against cuts to research budgets and, significantly, the Harper government's "muzzling" of scientists. Turnout, however, was lower than expected, which PIPSC president Debi Daviau attributed to a "climate of fear" that persistently deters scientists from speaking out (Voski, 2015).

One example of this alleged muzzling is the media protocol introduced at Environment Canada in 2007, which has come under fire for limiting the freedom of federal scientists to communicate publicly and professionally (Holmes, 2013; Klinkenborg, 2013; Linnitt, 2013; Mancini, 2013). It states, for example: "Media relations will work with individual staff to decide how best to handle the call; this could include asking the programme expert to respond with approved lines" (Environment Canada, 2007). A protocol requiring scientists to obtain official approval before speaking with the press can delay or prevent interviews with journalists, and can also force scientists to stick to the official party line. Other federal departments, such as Fisheries and Oceans Canada, are said to have similar media policies (Linnitt, 2013). It has also been reported that since the Harper government came into office (in the period prior to the refocusing of the NRC on applied, industrial research), the number of peer reviewed

NRC-authored publications has dropped significantly—from about 1,800 in 2006 to 570 in 2012 (Shendruck, 2013).

A report by Simon Fraser University and advocacy group Evidence for Democracy shows just how difficult it has become for federal scientists to speak freely (Magnuson-Ford & Gibbs, 2014). The report analyzed 16 federal science department and agency media protocols for openness of communication, protection against political interference, rights to free speech, and protection for whistleblowers (Magnuson-Ford & Gibbs, 2014). Its results indicate that, “Overwhelmingly, current media policies do not effectively support open communication between federal scientists and the media” (p. 3). The authors claim that the increased obstacles to open and timely communication with journalists, and the reduced protection from political interference experienced by federal scientists in past years, not only harms them, but all Canadians as:

[I]t denies the public access to vital information required for informed decisions. Perhaps more pressing, however, is the fact that when the public cannot access this information, it is increasingly difficult to determine whether government decisions are being supported by the best available science. Science itself thrives on transparency: science is strengthened when there is open dialogue stimulating debate and fruitful collaborations among scientists. (p. 3)

The Harper government has also been accused of misrepresenting scientific information. According to media accounts, the Conservatives tried to keep a 2008 Health Canada report on chrysotile asbestos, which was being used in both domestic construction and often exported to developing countries, from going public due to information in it that pointed to health and safety risks (McKnight, 2011). The government claimed that chrysotile was much less dangerous than other forms of asbestos, and then-industry minister, Christian Paradis, falsely claimed experts disagreed about the safe use and export of chrysotile (McKnight, 2011). The Chrysotile Institute, which was partially funded by the federal government, also maintained that chrysotile was fairly safe. In 2012, however, after much international criticism, the government stopped funding the Chrysotile Institute, which has since shut down.

### *Structural adjustment*

In May 2013, the Conservative government revealed its rebranding plan for the National Research Council (NRC), which would see the agency’s focus shifted away from so-called basic research—research for the purpose of knowledge gathering and discovery—and aimed toward applied research that could bolster Canadian industry. This change to the NRC’s mandate was presented as returning the agency to its wartime objective of industry-based research, and one that could see 70–80 percent of its current investments devoted to projects in the country’s commercial sector (Ovsey, 2013). The revamped NRC would be a “business-driven, industry-relevant research and technology organization” (National Research Council Canada, 2013). In announcing the reorientation, along with a commitment of \$121 million in public funds to aid the transformation, the minister of state for science and technology declared: “The NRC is open for business” (Allen, 2013). Underscoring the direction of this new mandate, NRC president John MacDougall observed: “Scientific discovery is not valuable unless it has

commercial value” (Toronto Star, 2013). Critics immediately attributed the policy change to an “anti-science” agenda that is particular to this government, with the *Toronto Star* editorial board, for example, concluding that the shift in the NRC’s mandate represented an “antagonism to evidence” that “reflects a misunderstanding of how science, including innovation, works; and suggests some confusion about the role of government” (Toronto Star, 2013).

The NRC’s rebranding as an agency focused on science for the sake of business is one item on a longer list of policy changes by the Harper government that have affected the status and structure of public science in Canada. Soon after their election in 2006, the Harper Conservatives made it clear they opposed Canada’s Kyoto Protocol pledges, which aimed at a six percent reduction in the country’s greenhouse gas (GHG) emissions by 2012. Canada signed the Kyoto protocol in 1997 under a Liberal government, despite it quickly becoming obvious that the six percent reduction goal was unrealistic. At the United Nations Bali Climate Change Conference in 2007, Harper opposed the implementation of binding targets, unless countries exempt from Kyoto’s GHG reduction requirements, such as China and India, also had targets imposed on them. In December 2011, the Harper government announced Canada would be the first nation to officially withdraw from its Kyoto pledges. At the time, Environment Minister Peter Kent said the move would save Canada \$14 billion in penalties, despite critics’ charges that Harper’s opposition to Kyoto, along with the government’s ignorance of environmental science and climate change and its industry-centred policies, would contribute to rises in GHG emissions (Holmes, 2013; Toronto Star, 2011). Canada’s commitment to the Kyoto Protocol officially ended in 2012 with the Conservative’s omnibus budget bill, Bill C-38.

Bill C-38 also saw the repeal of the *Canadian Environmental Assessment Act* (CEAA), which was originally established in 1992 to require federal departments and crown corporations to conduct environmental reviews of project proposals that operate under federal permits and licensing, or benefit from federal funding. Bill C-38 rewrote the CEAA to include a one project, one review policy, and the implementation of fixed timelines for reviews on major projects (including a limit of 24 months for reviews done under the CEAA), such as the Northern Gateway pipeline. Under the new framework, any project that does not fit the federal government’s definition of “major” will undergo assessment according to provincial criteria and, in cases where such provincial criteria do not exist, projects will not undergo any environmental assessment (Davidson, 2012). The new CEAA, which came into effect in July 2012, also saw the number of departments and agencies that can perform environmental assessments reduced from 40 to three, apparently to accelerate processing of reviews on projects that could benefit the Canadian economy (Davidson, 2012). Environmental groups worried especially about CEAA 2012’s impact on projects involving fossil fuels and pipelines, and have suggested it favours big business over protection of the environment (Davidson, 2012).

Bill C-38 saw similar changes made to the *Canadian Fisheries Act*, which was originally established to manage and protect the country’s fishery resources, and applied to all Canadian fishing zones, territorial seas, and inland waters. Specifically, Bill C-38 reworded the act to state “fish of economic, cultural or ecological value” would be pro-

tected, narrowing the category of protected fish and making it difficult to prove a species is in need of protection (Holmes, 2013). Critics also noted this change could make it easier for businesses to gain approval for industrial development (Fenton, 2012; Holmes, 2013).

### **A war on science?**

The foregoing litany of budget and resource cuts, information control, and structural adjustment has led to widespread characterization of the Harper government as “anti-science.” Concern over the government’s actions, and their implications, has been raised across multiple constituencies, including government, academic, and scientific communities, domestic and international journalists, advocates for open government and freedom of expression, professional associations, environmental organizations, and elected officials. In 2013, Democracy Watch filed a complaint with the federal information commissioner concerning the government’s interference with the freedom of federal scientists to speak publicly about their research and findings (Democracy Watch, 2013a). The accompanying report (Democracy Watch, 2013b) described the government’s actions as “a threat to democracy,” a charge that would later be echoed by prominent Canadian scientist and environmentalist David Suzuki (2013). Around the same time, the Canadian Association of University Teachers, an organization representing academic scientists in Canada, launched Get Science Right (2013a), a national campaign to “protect scientific integrity” and mobilize opposition to the government’s approach to science. In February 2014, the Professional Institute of the Public Service of Canada released two studies based on survey evidence detailing the impact of the government’s funding cuts and muzzling of federal scientists. Respectively titled *Vanishing Science: The Disappearance of Canadian Public Interest Science* (Professional Institute of the Public Service of Canada, 2014a) and *The Big Chill: Silencing Public Interest Science* (Professional Institute of the Public Service of Canada, 2014b), the reports describe the government’s cuts as “reckless” and a threat to “Canada’s natural environment, air and water quality, the survival of other species, and of course the health and safety of all Canadians” (Professional Institute of the Public Service of Canada, 2014a, p. 7), and the government’s communication protocols as “undemocratic, unprofessional and unnecessary” (Professional Institute of the Public Service of Canada, 2014b, p. 5).

Criticism of the government’s approach to science has also flooded the public sphere. Open letters to the prime minister and government protesting these measures and calling for their reversal have proliferated (see, for example, Canadian Science Writers’ Association, 2012). The online media platform *Huffington Post Canada* established a blog titled *Stifling Science*, which has become an influential and growing repository of documentation, citizen journalism, and commentary condemning the government’s actions related to science communication and funding (see Mancini, 2013). Mainstream journalists in Canada have described the Harper government’s approach to science as “Orwellian” (Gatehouse, 2013). Activist websites proclaim the “death of evidence—no science, no evidence, no truth, no democracy” (Death of Evidence, 2012), plead for “evidence for democracy” (Evidence for Democracy, 2013), make the case for “science that protects you” (Public Science, n.d.), and a call for “true north smart and free” (True North Smart + Free, n.d.).

There is no question the Harper government's cuts to publicly funded scientific research have negatively affected the state's capacity to monitor and regulate the environmental impact of commercial activity and industrial development, placing ecological sustainability and public safety at significant risk in an effort to remove constraints on market activity, particularly in the extractive sectors. It is also clear that the communication protocols imposed on federal scientists have dramatically undermined transparency, freedom of expression, and public access to knowledge, and have thus contributed to an alarming democratic deficit in Canadian society whereby the ability to hold both government and the private sector accountable has been severely compromised. As Chris Turner (2013) puts it in *The War on Science*, the combined effect of these measures has been "to reduce the government's ability to see and respond to the impacts of its policies, especially those related to resource extraction" (p. 31). Finally, it is indisputable that the government has systematically reoriented state priorities vis-à-vis science away from long-term, disinterested inquiry and toward short-term investment in research supporting commercial and industrial development, productivity, and economic growth. These tendencies may be regrettable from a democratic or environmental perspective, but they are nonetheless perfectly consistent with the neoliberal ideology of contemporary conservative partisans (Barney, 2002; Harvey 2007; Lave, Mirowski, & Randalls, 2010; Laycock, 2001).

While it is true the latter years of the current Conservative government have featured funding cuts to several scientific institutions and programs, it remains a fact that science and technology development are central elements of the Canadian economy, play a defining role in Canada as a modern society, and are crucial instruments in the organization of power and prosperity in Canada. None of this has changed under the Harper government. This is borne out in the Canadian state's ongoing massive financial investment in scientific activity and technological development, as well as its considerable rhetorical and policy investment in promoting the agenda of scientific and technological innovation. Understandably, critics of the government have consistently pointed to metrics by which state spending on science in Canada can be shown to have declined under the Conservative government. Thus, the Canadian Association of University Teachers (2015) points to a decline in major granting council research funding of 6.1 percent since 2007, borne disproportionately in the areas of so-called "basic research" and the humanities (p. 2). In the House of Commons in May 2014, Member of Parliament and the official opposition's Science and Technology critic Kennedy Stewart reported, "in just three years, Conservatives have cut over \$1 billion in research funding, and they have slashed the jobs of over 4,000 government scientists" (Stewart, 2014). Advocates of increased research and development (R&D) spending pursuant to greater productivity and economic growth, point to decreases in overall federal science and technology spending and employment in recent years, highlighting that, when adjusted for inflation, these levels have reached their lowest points in over a decade (Parkinson, 2014).

However, a closer look at funding and employment numbers suggest state support for scientific activity and technological development has remained relatively consistent since the election of the Harper government in 2006, when federal expenditures on

science and technology totaled \$9.9 billion<sup>1</sup> (Statistics Canada, 2015a). Thereafter, expenditures increased every year until 2014-2015, even after the federal stimulus package in response to the 2008 global financial crisis expired, and the government began to cut spending across the board in a manner consistent with its ideological priority on debt and deficit reduction. In 2014-2015, federal expenditures on science and technology were \$9.4 billion, a 5.5 percent decrease relative to 2006-2007, the first and only such decrease under the Harper Conservatives (Statistics Canada 2015a). Estimates for 2015-2016 signal a 2 per cent increase, which means spending in this area should roughly keep pace with inflation (Statistics Canada 2015b). Science and technology employment numbers have also remained relatively stable since the Conservatives took office. In 2006-2007, 36,027 people were full-time science and technology employees in federal departments and agencies; by 2014-2015 the number of federal science employees stood at 35,299, a minor decrease of roughly 2 percent, following significant spikes related to stimulus spending between 2008 and 2011 (Statistics Canada, 2015c). The government's approach would seem to reflect Canadian public opinion on science funding. A recent poll sponsored by the Institute for Research in Public Policy (2012) found 63 percent of those surveyed thought federal spending on scientific research should stay the same or be decreased. This does not mean that Canadians are "anti-science." It probably means that, for a variety of reasons, they have come to equate fiscal restraint with effective government.

Interestingly, while science and technology spending have declined slightly since 2012, they have generally done so at a lesser rate than that of government spending as a whole. In 2011-2012, total expenditures by the Canadian government were \$232.4 billion. Total expenditures in 2013-2014 were \$207 billion, a decrease of nearly 11 percent. Over the same period, total science and technology spending decreased by only 4.7 percent. In 2014-2015, decreases in overall spending and science and technology spending were roughly equivalent for the first time under the Harper Conservatives, at 10.5 percent and 11 percent respectively (Statistics Canada, 2015a). This suggests that if the government has been at war with anything it might be the public sector in general, not science in particular. The same might be said of the government's efforts to control communication by federal scientists. A recent report by Canadian Journalists for Free Expression (2015) describes an "insatiable appetite for controlling the flow of information and the substance of political debate" (Amber, 2015, p. 24) on the part of the Harper Conservatives—one that extends far beyond public sector scientists to encompass the entire range of government communication. The report documents the denial of information to federally appointed officials, such as the auditor general and the parliamentary budget officer, the systematic obstruction of citizens' and journalists' access to information requests, and unprecedented restriction by the prime minister's office of elected officials' public communication. In this context, the "muzzling" of scientists appears less as evidence of a particular "anti-science" campaign, and more as one part of a more general program of information control.

The argument that the structural adjustment of federal scientific activity can be attributed to anti-science motives particular to the Harper Conservatives is similarly questionable. In the manner of its Progressive Conservative and Liberal predecessors,

the Conservative government under Stephen Harper has consistently promoted the image of scientific and technological innovation as a key driver of the Canadian economy and a definitive element of Canadian national identity, and used this to justify structural adjustments of the state and the economy along neoliberal lines (Barney, 2007). While most critics have characterized the government's NRC realignment as a radical departure, it is probably more accurate to describe it as the culmination of a process that began in 1988, when the Progressive Conservative government of Brian Mulroney created the Networks of Centres of Excellence (NCE) program as a means to facilitate partnerships between public sector scientists and the private sector aiming at developing commercial applications. Describing this as "the most dramatic change in Canadian science policy since the National Research Council was established in 1916," science studies scholar Janet Atkinson-Grosjean (2006) found the NCEs "initiated a fundamental shift in the organization of science in Canada ... to turn university researchers away from basic science and towards commercial application ... research should not only be 'managed'—a novel concept—but managed on private-sector rather than academic principles" (pp. xiii–xiv). In this light, the steps taken by the Harper government appear less than revolutionary, and more as the completion of a two decades-long project to restructure Canadian science to support Mode 2 knowledge production, which, in contrast to the basic research of Mode 1 knowledge production, focuses on research aimed directly at near-term, practical applications (Gibbons, Limoges, Nowotny, Schwartzman, Scott, & Trow, 1994; Nowotny, Scott, & Gibbons, 2001).

In 2007, early in its first mandate, the Harper government released its innovation strategy under the title, *Mobilizing Science and Technology to Canada's Advantage*. The document begins by affirming: "Science and Technology comes into almost every aspect of our lives, helping us to solve problems and create opportunities," and adds, "Canada can and must do more to turn our ideas into innovations that provide solutions to environmental, health, and other important social challenges, and to improve our economic competitiveness" (Industry Canada, 2007, p. 1). As the document proceeds to make clear, in this case, "doing more" actually means doing less:

This Science and Technology Strategy recognizes that the most important role of the Government of Canada is to ensure a free and competitive marketplace, and foster an investment climate that encourages the private sector to compete against the world on the basis of their innovative products, services and technologies. The government also has a role in supporting research and development which is the basis of new discoveries that lead to improved lives, better jobs, and new business opportunities. To achieve world excellence in science and technology, Canadians must promote and defend two complementary and indivisible freedoms: the freedom of scientists to investigate and the freedom of entrepreneurs to innovate and market their product to the world. (Industry Canada, 2007, p. 19)

This does not sound very much like a declaration of war on science. It does sound like a recipe for bringing science and technology development into conformity with the priorities of market ideology and capitalist industry, which is exactly what the Harper government has done.

The government's predisposition was encouraged by a series of high-level assessments of the science and technology sectors, none of which found government support for science or Canadian scientific performance to be inadequate, but all of which concluded the government must do more to ensure the conversion of Canada's scientific capacity into business innovation, commercial development, and economic growth. The first of these was the 2011 report of the Expert Panel on Federal Support to Research and Development (known as the Jenkins Report). Mandated by the minister of state for science and technology, the panel's report set an agenda for effectively reconceiving the federal role in science and technology in terms of business innovation and commercialization—including a recommendation to transform the National Research Council into an agency for the scientific support of business R&D (Expert Panel on Federal Support to Research and Development, 2011). Similarly, in 2012, the federally appointed Science, Technology and Innovation Council (STIC) praised Canada's performance in public science: "Substantial investment in research in the higher education sector has reaped significant rewards, as the production and refinement of scientific knowledge in Canada continue to be characterized by vitality and high quality." STIC also, however, lamented Canada's poor record in knowledge transfer and private sector R&D, and recommended increased government support for industry-driven research (Science, Technology and Innovation Council, 2012). Also in 2012, the independent Council of Canadian Academies released a report by its expert panel entitled *The State of Science and Technology in Canada*, which concluded that "Canadian S&T [science and technology], within the scope of this assessment, is healthy and growing in both output and impact" [Council of Canadian Academies, 2012, p. xii], (i.e., when measured in terms of citations and reputation), but also pointed out the sector's poor performance in terms of patent generation, licensing, and royalties. These reports effectively set the stage for the science and technology chapter of the government's 2013 budget, a key moment in its reconfiguration of Canadian science policy. Along with completing the rebranding of the NRC, the budget placed heavy emphasis on investing in scientific support for business innovation, strengthening partnerships between universities and industry, encouraging the commercialization of research, building innovation hubs, and fostering entrepreneurial culture and a positive climate for venture capital (Canada, 2013), themes that have remained prominent in subsequent federal budgets.

Describing the Harper government as "anti-science" thus fails to account for the Canadian state's substantial, ongoing investment of public funds and strategic attention in the science and technology sectors, and does not adequately describe the character of its priorities and actions in this area. Any residual anti-science sentiments that might linger in certain corners of the Conservative mindset have been eclipsed by a pro-capitalist imperative that demands the mobilization of science and technology as forces of "innovation" in the service of commercial and industrial development—a role (though certainly not the only role) science has played for at least as long as there has been a capitalist economy. The 2015 federal budget drew criticism from scholarly organizations for its failure to increase base-funding to the major granting councils (amounting to a small decrease in terms of constant dollars), but it also announced

several multimillion dollar funding commitments for targeted research programs, university-industry R&D partnerships, the revamped National Research Council, digital research infrastructure, and the Canadian Foundation for Innovation, to name a few (Oliver, 2015). There are good reasons to be critical of a funding structure such as this, which binds scientific research even more closely to the priorities of industry and commerce (Canadian Association of University Teachers 2015). However, to describe this level of investment as “anti-science” is a misnomer, as it clearly constitutes substantial, ongoing material support for scientific research and technological innovation as a mechanism of market-driven economic development. This might be a different kind of science, but it is still science.

### **The poverty of “anti-science”**

In a culture that has a generally high public regard for science and scientists (Conrad, 1999; Geller, Bernhardt, Gardner, Rodgers, & Holtzman, 2005; Hinnant & Len-Rios, 2009; Nelkin, 1995; Ward & Jandciu, 2008), the strategic value of characterizing one’s political opponents as “anti-science” is considerable, which probably accounts for the frequency with which the charge has been invoked by actors across the political spectrum. However, what remains unclear is whether the label “anti-science” describes a view that actually exists in the world, or, even if it does, whether it can be assigned reliably to a particular position on the political spectrum. In the U.S. context, for example, the attribution of an “anti-science” program to those on the right of the ideological spectrum has continued long after the end of the Bush administration (Liebell, 2013; Otto, 2012). Others have pointed to the progressive Left as truly anti-science (Berezow & Campbell, 2012), on account of beliefs that associate cell phone use with brain cancer, vaccines with autism, and various consumer products and medical procedures with assumed hidden risks to one’s health and the environment (Otto, 2012). In Canada, a prominent conservative columnist recently asked why the Harper government’s apparent war on science has received so much coverage in the media, while progressive anti-science sentiments pass with little criticism. She wonders why, in face of environmentalists’ refusal to recognize the “proof” of the safety of pipelines and fracking, it is nonetheless conservatives “who are generally condemned for dogmatically refusing to embrace science” (Wente, 2014, n.p.).

At a minimum, the “anti-science” label is intended to describe people or groups that are hostile toward science itself (Holton, 1993). However, while both the climate change denier and the “anti-vaxxer” are accused of being anti-science, research indicates that holders of such beliefs, regardless of political identity, are not actually hostile toward science. For example, the Pew Research Center (2009) has found no evidence to link the disbelief in evolution or denial of climate change to higher levels of negativity toward science and scientists. Furthermore, a study (Kahan, 2014a) by Yale University’s Cultural Cognition Program that focused on vaccines and risk perception found, “There was no meaningful relationship between political outlooks and vaccine-risk perceptions. On the contrary, Democrats as well as Republicans saw vaccine risks as low and vaccine benefits as high.” The same study notes that using the “anti-science” trope to discredit another’s beliefs can actually produce a polarization of views that would not otherwise exist. As Dan Kahan describes, “while the ‘anti-sci-

ence trope' currently lacks any empirical foundation, asserting it anyway might well help to foster the sorts of public divisions that inform other issues in which dueling partisans hurl the 'anti-science' epithet at one another" (Kahan, 2014b, n.p.). In other words, the rhetorical value of the anti-science label exceeds its descriptive value by a significant margin.

The discrepancy between the descriptive and rhetorical value of the anti-science charge comes at the expense of more robust public debate concerning the relationship between science, politics, and public policy. Gerald Holton (1993) makes a similar point: "The term *anti-science* can lump together too many, quite different things that have in common only that they tend to annoy or threaten those who regard themselves as more enlightened" (p. 146). Furthermore, as Jack Stilgoe (2012) observes, "'anti-science' is a term that is imaginary and unhelpful. It describes almost nobody and it gets us nowhere." He goes on to point out that the problem with climate change deniers is not that they are anti-science (whatever that might mean), but that they are opposed to environmental protection and the limits on industrial activity and consumption it entails. By the same token, we might say the virtue of those seeking a meaningful and effective policy response to the facts of climate change is not that they are "pro-science," but that they are committed to decreasing the contribution of human activity to global warming and to inhabiting the planet in a more sustainable way. The question arises: is it better for these two opposing camps to confront each other in the public arena over their real political differences, or over an imagined one? In this sense, the phrase "anti-science" does more to obscure these differences and defer their confrontation than it does to expose and engage them.

There is an important debate to be had in Canada (as in most other societies with advanced capitalist economies) about the orientation and organization of scientific inquiry, research, and knowledge production in relation to industry, state, and civil society, and how public policy in these areas can be configured to best serve the public interest. The record of the Harper government clearly demonstrates that Canadian Conservatives have strong and determined positions on these issues that correspond to their broader ideological commitments. We have tried to show that "anti-science" is an inaccurate label for these positions, however effective it might be in mobilizing political opposition. Furthermore, it also undermines the possibility of engaging in substantial consideration of the several alternative ways in which science could be aligned with the public interest. Such consideration, and the debate it would necessarily entail, is premised on an understanding that science is always, and always has been, bound up in the social and political priorities of the historical, cultural, and institutional settings in which it takes place (Jasanoff, 2004; Proctor, 1991). By contrast—in their efforts to capitalize on the rhetorical efficiency of the "anti-science" label as a proxy for what might be described more accurately as the structural transformation of science along neoliberal lines—critics of the Harper government promote an untenable conception of science that imagines it can and should be devoid of political influence or implication.

A representative example of this tendency is Chris Turner's (2013) *The War on Science*. The book does an excellent job documenting the Harper government's record on science and signalling its implications: "the Canadian government has instigated

a systematic, sustained campaign ... to cripple its ability to detect and respond to [climate change] crises, to monitor environmental damage and deal with disasters, even to conduct and communicate basic science in the public interest” (p. 20). As Turner observes, for this government, “[t]he purpose of research—of science generally—is to create opportunities for industry, and the purpose of government is to assist in that process in whatever way it can” (p. 112). However, in construing this as comprising a “war on science,” Turner invokes an account of the practice, role, and history of science that is equally ideological.

In Turner’s (2013) account, modern Canada was founded upon an “evidence-based social contract” in which “scientific evidence existed outside of [the] cacophonous arena of competing opinions. The parameters of [political] debate were established by observable, verifiable, peer-reviewable reality, not by political expediency or strategic advantage” (p. 3). Turner acknowledges science took hold on the North American continent as part of the colonial project to render the territory’s natural resources knowable and available for commercial exploitation (see Zeller, 1987). However, this mercantilist orientation gradually gave way to what Turner (2013) describes as the “enlightened” tradition in Canadian science. In this view, “the light of reason and the revelations of science would form the foundations of public policy, implemented by a law-making body well-informed by the best scientific expertise and objective data it could obtain ... when it came to writing laws, managing departments, and conducting research in the public interest, reason and evidence would trump ideological arguments and short-term political goals” (pp. 53–54). Despite the privileged role posited for scientific knowledge in relation to government in this account, it is still presented as somehow above and beyond politics, its practitioners cast as heroically rational and free of political implication: “They place the highest value on reasoned argument and cloistered study, proceeding from the core belief that scientific evidence, objectively gathered and impartially analyzed, must always trump opinion and argument and shouted slogan in the establishment of what is true and reasonable and which courses of action best serve the public interest” (p. 2), which was confirmed for Turner (2013) in the 2012 “death of evidence” protest, by its “simple assertion that scientific evidence was sacrosanct, that the final arbiters of truth toiled not in the House of Commons but in the laboratory” (p. 4).

There is not very much in this account of a foundational “evidence-based social contract” (Turner, 2013, p. 3) that could withstand scrutiny by historians of science, social studies of science and technology, or even a critical social or environmental history of Canada. Such an account reifies almost every binary these bodies of scholarship have taught us to deconstruct: the objective and subjective conditions and outcomes of knowledge claims (Daston & Galison, 2007; Porter, 1996); pure and applied forms of science (Fleck, 1979; Latour, 1988); the laboratory and the social worlds in which it is situated (Latour & Woolgar, 1986; Shapin & Shaeffer, 1985); commerce and enlightenment (Latour, 1993; Stengers, 2000); evidence and opinion (Daston & Galison, 2007; Haraway 1997; Shapin & Shaeffer, 1985); expertise and politics (Callon, Lascoumes, & Barthe, 2011; Goldman & Nadasdy, 2011; Latour, 2013). It also effaces the actual history of science in Canada, in which various progressive and destructive

intentions and outcomes have fallen differentially on those who have been targets of the “enlightenment” prescribed by what is “true and reasonable.” To raise but one example, Turner (2013) celebrates the various agencies of agricultural science established by the state in the nineteenth century that “helped turn Canada into one of the world’s most abundant breadbaskets” (p. 51), but nowhere acknowledges the role science played in the dispossession and starvation of the Indigenous peoples upon whose lands modern prairie agriculture was erected—populations that would later become the unwilling subjects of scientific experimentation in the field of nutrition (Daschuck, 2014; Mosby, 2013; Savage, 2012). Moreover, the complicity of scientific knowledge production in the extractive project of Canadian modernity has not been restricted to the early days of Western settlement. In her comprehensive study of the development of hydro-electricity in northern Québec, Caroline Desbiens (2013) demonstrates that, starting in the 1970s, state-sponsored science has explicitly constructed the territory as an “open-air laboratory” to generate knowledge in aid of “large-scale resource exploitation.” As she describes:

public understanding of the region has been rewritten in the language of Western science, and, as a result, local knowledge of the area has been marginalized ... the dominant framing of northern Quebec in the language of science, narrowly understood to be outside the purview of indigenous modes of knowledge production, has diminished the diversity of environmental knowledges and perspectives on the land. (pp. 138–140)

Indigenous peoples have both epistemological and material reasons to be skeptical of Enlightenment science (Deloria, 2007; Seth, 2009). How, for example, does an “evidence-based social contract” account for Indigenous people who refuse to provide samples of genetic material for research (Muller, 2009)? Are they, in the same vein as the Conservatives, “anti-science” and therefore retrograde? If the Conservatives are “anti-science” does that make their critics “pro-science” and, if so, does this require them to also take sides against these Indigenous critics of science? Such are the corners into which the rhetoric of “anti-science” paints us.

Similarly, it is a curious defense of democracy that aggressively champions “the laboratory” as the “final arbiter of truth,” such that all the processes of mediation, translation, and deliberation that are required to make evidence legible and actionable should give way to a straightforward regime of implementation of scientific findings. In this case, the argument against “anti-science” takes on the appearance of a technocratic argument against democratic politics itself, which is clearly not the intention of critics such as Turner (2013). When the campaign True North Smart and Free advocates for “making decisions based on evidence, not politics,” declares that “science makes our country strong” and warns that this strength is being “undermined by politics,” and promotes “candidates who will choose evidence over politics” (True North Smart + Free, n.d., n.p.), it adopts an anti-politics posture that is as alarming from a democratic perspective as the anti-science position it contests. It also misconstrues the relationship between science and politics. Science arises in political settings that cannot help but influence its course; its methods, instruments, and language bear decisively on the quality of the knowledge it makes known (Harding, 1993). Acting on this knowledge requires

political translation and mediation. The outcome of such action always has implications for human relationships and practices, and for the distribution of benefits and possibilities (Harding, 2008). This is as true for progressives as it is for conservatives.

## Conclusion

Our aim in this article has not been to excuse the Harper government for its record on science—its cuts and closures, its censorship, its placement of knowledge production in the service of capital—nor to minimize the extent of its environmental irresponsibility, its reckless promotion of extractive industries in the face of climate change, or its shameful treatment of scientists employed in the public interest. Instead it has been merely to argue that “anti-science” is a poor way to describe all of this. The Harper government has intensified the structural adjustment of science in Canada along neo-liberal lines, such that it is more closely aligned with industrial development and commerce, and has diminished the capacity of science to prompt regulatory oversight and intervention in markets. The Canadian state remains heavily invested in scientific research and technological development as a constitutive feature of its identity and its political economy. Describing this situation as “anti-science” probably has strategic benefits, but it comes at the expense of a more precise reckoning with the politics actually driving these measures, and entails promotion of an ideal of science abstracted from culture, politics, and history. In both these respects, the deployment of anti-science rhetoric risks undermining the prospect of public and political deliberation upon the many alternative ways in which science and other forms of knowledge production might be organized and oriented to serve diverse interests and communities.

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## Note

1. This and subsequent figures are rounded, and expressed in constant 2007 Canadian dollars.

## Websites

Evidence for Democracy, [www.evidencefordemocracy.ca](http://www.evidencefordemocracy.ca)  
 Public Science, [www.publicscience.ca](http://www.publicscience.ca)  
 True North Smart + Free, [www.truenorthsmartandfree.ca](http://www.truenorthsmartandfree.ca)

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