The origins and early history of Canada’s Cold War scientific intelligence, 1946-65

Matthew S. Wiseman
Department of History, University of Waterloo, Waterloo, ON, Canada

Abstract
In the process of creating the policies and structures that led to the formal organization of Canada’s Defence Research Board after the end of the Second World War, senior military and defence officials in Ottawa conceptualized and established a scientific intelligence bureau within the defence department. Recognizing the heightened military significance of science during the war, defence officials believed that scientific intelligence—the practice of analyzing scientific information for forecasting the weapons and warfare potential of enemy countries—could support and improve Canada’s military preparedness efforts in the immediate postwar period. Using recently opened government and military records, this article explores the origins and history of Canadian scientific intelligence during the early Cold War, framing the topic as useful for understanding Canada’s military past and Ottawa’s approach to some of the country’s top security and defence issues of the late 1940s through the mid-1960s.

Keywords
Scientific intelligence, military intelligence, Cold War, Arctic, Defence Research Board

Corresponding author:
Matthew S. Wiseman, Department of History, University of Waterloo, 200 University Avenue West, Waterloo, ON N2L 3G1, Canada.
Email: matthew.wiseman@uwaterloo.ca
“Obviously, if we do not know how or by what we will be attacked, it is extremely difficult to prepare ourselves for defence. ... In particular, one of the objects of ‘Scientific Intelligence’ is to try to forecast the type of novel weapons which may be used against us in the future. Without that knowledge it is clearly difficult to plan logically any long term Defence Research.”

– Canadian report on scientific intelligence, May 1949

In May 1946, the director general of defence research at Canada’s Department of National Defence (DND), Omond Solandt, wrote a preliminary report to the minister of national defence, Douglas Abbott, outlining the immediate research and development (R&D) needs of the Canadian armed services. With respect to matters of defence and national security, Solandt’s report laid the foundations for the establishment of the fourth arm of the Canadian military—the Defence Research Board (DRB)—and emphasized the value and importance of scientific intelligence to Canada’s postwar military preparedness: “The need for secrecy in military research greatly impedes the free inter-change of information,” Solandt claimed. “It is therefore essential that a defence research organization should devote a relatively large part of its resources to ensuring that its workers are kept fully informed of both secret and non-secret information needed in their work.”

Within a year of this report, an amendment to the National Defence Act allowed for the creation of the DRB and the beginnings of the scientific intelligence body Solandt had envisioned.

Scientific intelligence constituted the practice of analyzing scientific information for forecasting the weapons and warfare potential of enemy countries. Solandt believed in the necessity of gaining a better understanding of the latest research developments made on the other side of the Iron Curtain. He convinced Canada’s top defence officials that assessing the military capabilities of enemy states, namely the Soviet Union and its satellites, through scientific intelligence, could support Canada’s postwar military preparedness efforts while reinforcing the Canadian commitment to North Atlantic security. Solandt’s position was clear: gaining knowledge about the scientific and technical research activities of the enemy was essential for understanding and defending against their war potential, and he used this argument to convince DND officials of the military value of scientific intelligence and establish a special scientific intelligence bureau within the DRB.

Officially established in April 1947 as the fourth branch of DND and the research arm of the Canadian military, the DRB funded and facilitated scientific and

1. Defence Research Board, Scientific Intelligence Division, May 1949, file 710–0 pt. 1, Record Group (RG) 24 C-11638, Library and Archives Canada (LAC). Document obtained from the Canadian Foreign Intelligence History Project (CFIHP) collection, maintained by Alan Barnes and Timothy Sayle, at Carleton University. See https://carleton.ca/csids/canadian-foreign-intelligence-history-project/ (accessed 4 July 2022).

2. O.M. Solandt, Policy and Plans for Defence Research in Canada: A Preliminary Review, Appendix A: Suggested Fields for Defence Research, May 1946, 16, file Speeches – Reporting etc. 1947–March 1953 volume I, vol. 2425, RG 24, LAC.
technological research projects for DND’s other three branches: the army, navy, and air force.\textsuperscript{3} Canada did not have a government organization or branch devoted solely to military research at the end of the Second World War. The various scientific bodies of the National Research Council (NRC) had performed and paid for research to support the armed services. In the transition to peace, senior defence officials in Ottawa recognized the critical importance of funding a concerted military research program and invested in creating the DRB, which divested the NRC of its military research commitments.

As the DRB’s founding chairman, Solandt created an internal bureaucratic structure and recruited top Canadian scientists and engineers to work for the defence department. Scientific intelligence was one of six core responsibilities he mandated for the newly formed DRB.\textsuperscript{4} He believed that scientific intelligence would supply Canada’s top military and defence officials with information useful for understanding and reacting to the evolving threat of biological, chemical, and atomic warfare. By 1949, operating under this belief, Solandt and his colleagues had established a Directorate of Scientific Intelligence (DSI) within the DRB, creating a scientific intelligence body in the defence department. Concerns about postwar military preparedness, underscored by the need to defend against the rapidly evolving weapons and delivery systems of the early Cold War period, fomented the DSI’s creation and the role of intelligence officers in Canada’s fledgling scientific intelligence bureau.

This article advances scientific intelligence as important to intelligence studies and the intersection of postwar Canadian military history and the history of science. Senior military and defence officials in Ottawa devoted considerable financial resources and personnel to scientific intelligence, fostering the DSI to advance Canada’s overall intelligence capability. As historians continue to study and describe the origins of Canada’s intelligence structure in the post-1945 period, scientific intelligence represents a relatively new and important topic that deserves attention and scrutiny. Studying the DRB and scientific intelligence provides a fuller picture of Canada’s intelligence organization during the early Cold War whilst signalling the importance of including military R&D and scientific intelligence in future studies of Canadian intelligence. Indeed, this topic holds value for both historians and contemporary intelligence scholars alike. While unique security and defence issues of the early Cold War motivated the DSI’s creation, scientific intelligence became embedded within Canada’s overall intelligence structure, and senior officials in Ottawa championed this area of work as Canada’s intelligence organization evolved in the second half of the twentieth century.

\textsuperscript{3} On the Defence Research Board, see D.J. Goodspeed, \textit{A History of the Defence Research Board of Canada} (Ottawa: Queen’s Printer, 1958); and Jonathan Turner, “The Defence Research Board of Canada, 1947 to 1977,” (PhD dissertation, University of Toronto, 2012).
\textsuperscript{4} The DRB’s six initial divisions included Weapons and Equipment Research, Electrical Research, Special Problems Research, Biological Research, Naval Research, and Scientific Intelligence. See Goodspeed, \textit{History of the Defence Research Board of Canada}, 76.
The origins and early history of the DSI suggest that the study of scientific intelligence is useful for developing a fulsome understanding of Canada’s intelligence structure, in the context of both the Cold War and post–Cold War eras. Historical scholarship about the institutional and diplomatic elements of the Canadian intelligence regime continues to grow, and there is ample work on the history of the DRB and military science in post-1945 Canada to investigate the development and role of scientific intelligence within the context of Canada’s wider intelligence organization. Captain Donald Goodspeed’s official history of the DRB broaches scientific intelligence in brief, but its 1958 publication date leaves large gaps in the DRB’s documented record. Historian Jonathan Turner wrote an updated institutional history of the DRB in 2012, using newly opened government documents to fill in several gaps and produce an excellent resource on the DRB’s history and archival record. Moreover, political scientist Kurt Jensen documented the DRB’s standing within the Canadian intelligence regime in his work on the formative years of Canada’s foreign intelligence service, and intelligence scholar Alan Barnes has mentioned the subject of scientific intelligence in his work on the evolution of strategic intelligence assessment in Canada between 1943 and 2003.

The DSI’s history also holds value for interpreting the role of defence scientists in Canada’s postwar intelligence structure. As American historian Ronald Doel contends, scientific knowledge was central to Cold War diplomacy, and studying scientists and scientific intelligence is crucial for understanding the full scope of intelligence work among the Western security partners. The DSI’s history indicates a similar pattern for Canada, suggesting that scholars of Canadian intelligence in the post-1945 period should include the DRB and scientific intelligence in their work. In fact, Solandt and his colleagues in the DRB convinced senior DND officials of the importance of scientific intelligence and recruited scientists to work as intelligence officers in the defence department. The high demand for specialized knowledge of the latest real and potential military applications of novel R&D signalled the importance of scientific intelligence and created an urgent need for a select group of qualified intelligence officers. In turn,

5. By order of publication date, see Wesley K. Wark, “The evolution of military intelligence in Canada,” Armed Forces and Society 16, no. 1 (1989): 77–98; Scott Anderson, “The evolution of the Canadian intelligence establishment, 1945–1950,” Intelligence and National Security 9, no. 3 (1994): 448–471; Lawrence Aronson, “Preparing for armageddon: JIC 1 (Final) and the Soviet attack on Canada,” Intelligence and National Security 19, no. 3 (Autumn 2004): 490–510; Kurt F. Jensen, “Canada’s foreign intelligence interview program, 1953–90,” Intelligence and National Security 19, no. 1 (2004): 95–104; Dennis G. Molinaro, ed., The Bridge in the Parks: The Five Eyes and Cold War Counter-Intelligence (Toronto: University of Toronto Press, 2021).
6. Goodspeed, History of the Defence Research Board of Canada, 78.
7. Turner, “The Defence Research Board of Canada, 1947 to 1977.”
8. Kurt F. Jensen, Cautious Beginnings: Canadian Foreign Intelligence, 1939–51 (Vancouver: University of British Columbia Press, 2008), 140–142; Alan Barnes, “A confusion, not a system: The organizational evolution of strategic intelligence assessment in Canada, 1943 to 2003,” Intelligence and National Security 34, no. 4 (2019): 466.
9. Ronald E. Doel, “Does scientific intelligence matter?” Centaurus 52, no. 4 (2010): 311–322.
DND officials adopted scientific intelligence as part of Canada’s wider efforts to wage the Cold War, relying on defence scientists to fulfil a serious need of Canadian security and national defence during the atomic age.

**Canada’s Directorate of Scientific Intelligence**

Solandt first conceptualized a formal government body for scientific intelligence in March 1946, two months before he submitted his report about Canada’s postwar military R&D needs to the defence minister. In a confidential brief written for the Joint Intelligence Committee (JIC), Colonel Wallace “Wally” Goforth, writing on Solandt’s behalf, recommended the creation of a new body, a “Scientific Intelligence and Information Service,” under the purview of the director general of defence research. “The primary purpose of this service,” Goforth wrote, would be to provide “specialized assessment and interpretation of the most recent advances on each sector of the scientific frontiers, so as to indicate immediate and long term implications in respect of defence armament and policy.”

Solandt wanted a formal body for gathering intelligence through scientific literature and established channels. He envisioned a permanent staff composed of retired and reserve officers with academic training working alongside civilian scientists capable of interpreting and reporting on scientific progress in nuclear physics and related fields.

Surveillance was central to the original concept for scientific intelligence in the Canadian government. Agreeing that a national military R&D program required effective and uniform security, Solandt and Goforth proposed a series of controls designed to govern the envisioned intelligence bureau that they hoped to establish within DND’s scientific research branch. They suggested screening Canadian academics to produce a record of scientists considered suitable for employment on defence projects, stressing the need for qualified and reputable men who were willing to support the national interest. Emphasizing the importance of factual oversight, they also called for a full list of organizations and activities involving scientists and engineers in allied and enemy countries. Solandt and Goforth also wanted information about scientific and engineering research in fields related to defence and national security, as well as ready access to technical information about new and improved weapons and delivery systems developed abroad. To collect and distribute scientific intelligence pertinent to national defence, they proposed establishing reporting sections for research in the physical and biological sciences. At the core of the conceptualized bureau was a specialized group of intelligence officers equipped with the expertise and resources required to monitor foreign scientific research for real and potential military applications.

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10. Colonel W.W. Goforth, DGDR [Omond Solandt], “A Scientific Intelligence and Information Service for Director General of Defence Research (Tentative Statement of Intentions and Plan),” 27 March 1946, file 1274–10, part 5, vol. 33542, RG 24, LAC. CFIHP collection.

11. Ibid.
Solandt and Goforth submitted their proposal at a time when security and national defence was top of mind for Canadians, in both government and public circles alike. Following the public headlines of Igor Gouzenko’s defection from the Soviet Union, senior military and defence officials in Ottawa grew increasingly concerned about the stability of postwar peace and the implications for Canada.¹² While intelligence channels established and strengthened during the war provided information and assessments from the United States and the United Kingdom, officials in the Canadian defence department argued that Canada required stronger independent intelligence capability moving forward. As Alan Barnes describes in his research on the history of Canada’s intelligence structure, defence officials criticized the JIC’s assessment of the Soviet threat to North America in April 1946 and called for greater Canadian intelligence on the Union of Soviet Socialist Republics (USSR).¹³ This spurred a rapid growth in intelligence capability within the Canadian government, with the JIC expanding from three service directorates to include intelligence divisions in several government branches, including what would become the DRB’s Directorate of Scientific Intelligence.

Solandt and the DRB’s senior staff chose Lieutenant-Commander Arthur “John” G. Langley, a veteran of both world wars with science degrees from post-secondary institutions in Canada and the United Kingdom, to become the DRB’s first director of scientific intelligence.¹⁴ Born to Canadian parents in England in 1899, Langley attended prep school at Osborne before enrolling as a student at Dartmouth in 1914. He spent the war years at sea, serving as a cadet and earning successive promotions, first to midshipman and then to lieutenant. Demobilized from service in 1922, he moved to Montreal and studied physics at McGill. Following his graduation, Langley returned to England for post-graduate studies and later joined the British Admiralty as a civilian research scientist. Recruited by MI6 in the late 1930s, he headed a research establishment at Aston House, Hertfordshire, helping to develop novel sabotage weapons for the British forces.¹⁵ He invented a time pencil detonator during the war—produced in large quantities for agents and resistance fighters in Europe—that functioned as a reliable and widely used attachment for detonators or short-length safety fuses. Afterward, Langley moved back to Canada, making a home in Ottawa and joining the DRB as director of scientific intelligence in 1948.

¹². On the Gouzenko affair, see Reg Whitaker and Gary Marcuse, Cold War Canada: The Making of a National Insecurity State, 1945–1957 (Toronto: University of Toronto Press, 1994), 27–30; Dennis Molinaro, “How the Cold War began ... with British help: The Gouzenko affair revisited,” Labour/Le Travail 79 (Spring 2017): 143–155.
¹³. Barnes, “A confusion, not a system,” 466.
¹⁴. For biographical information about Langley, see Des Turner, SOE’s Secret Weapons Centre: Station 12 (Stroud, Gloucestershire: The History Press, 2011).
¹⁵. For information about Langley’s work and wartime contributions at Aston House, see “The first CO’s story,” in Turner, SOE’s Secret Weapons Centre; no page numbers listed. Turner published portions of Langley’s memoir, which he cites as being available in its entirety at the Imperial War Museum in London.
Langley’s military background, scientific research experience, and familiarity with the defensive and technical aspects of postwar Canadian defence issues reaffirmed in the minds of leading DND officials that they had found the right person for the job. By February 1949, with Langley on board, Solandt and his planning group headed by Goforth had formed a functioning scientific intelligence bureau within the DRB. Langley visited the Pentagon that month and met with top US military officials, where he discussed the importance of information exchange between military scientists in Ottawa and Washington and briefed his American counterparts on Canada’s fledging Scientific Intelligence Division of the DRB. Before returning to Canada, Langley supplied a secret memorandum to US Air Force Colonel L.W. Proper indicating the Canadian priorities for the DRB’s new intelligence bureau. Among the key objectives outlined by Langley were the need to “produce forecasts on probable future trends of warlike developments to assist in planning Defence Research” and to “form and train a nucleus of Scientific Intelligence Officers” capable of gathering and studying scientific intelligence on the Soviet Union and its satellites.\(^{16}\)

The newly branded Directorate of Scientific Intelligence included security and foreign intelligence sections.\(^{17}\) Officers in the DSI’s “security section” protected Canada’s defence scientific information and the work performed by DRB-funded scientists and engineers, which included vetting DRB scientists and contracted experts who worked on classified research for the Canadian armed services. DSI security officers also served as intelligence advisors for senior authorities in the DRB, liaised with other security agencies in Canada and elsewhere, and maintained responsibility for the physical security of all DRB establishments and personnel. Officers in the DSI’s “foreign intelligence section,” on the other hand, performed scientific and technical analysis of novel research and technological developments in enemy states. They prepared scientific appreciations, exchanged information with personnel from other intelligence branches of the federal government, and cleared papers and lectures for publication or oral communication outside official government channels.

Solanfandt saw this latter function, intelligence gathering and analysis of the latest advances in the military applications of science, as the core work of Canada’s scientific intelligence bureau.\(^{18}\) If understanding the rapidly evolving postwar strategic threat to North America depended on accurate information about the warfare potential of the Soviet Union and its satellites, scientific intelligence offered a practical (and arguably necessary) method for fighting the Cold War. As Brandon Webb demonstrates in his

\(^{16}\) A.J.G. Langley to Colonel L.W. Proper, 21 February 1949, file 004–100–74/34–3, vol. 17601, RG 24, LAC. CFIHP collection.

\(^{17}\) Annual Report of the Defence Research Board, 1 April 1949 – 31 March 1950, report no. D.R.22, 31 March 1950, 11, box 854, RG 319, National Archives and Records Administration (NARA), College Park, Maryland.

\(^{18}\) For a formal organizational chart of the DRB’s Directorate of Scientific Intelligence, see Scientific Intelligence Division, 11 October 1949, file 004–100–74/34-3, vol. 17601, RG 24, LAC. CFIHP collection.
research on governmental oversight of communist visitors to Canada in the late 1950s and early 1960s, cross-cultural exchanges between scientists from Canada and the USSR provided officials in Ottawa useful information about the latest developments in science and technology in the Eastern bloc. In both civilian and government circles, science could, and did, function in service to the state, generating threat-assessment knowledge of direct importance to postwar Canadian military preparedness.

The DSI originally included a third section devoted to the collection and dissemination of novel scientific information. Officers in the “Scientific Information Centre” gathered and maintained records with scientific and technical information pertinent to Canadian security and national defence. They collected, managed, and distributed classified defence research reports prepared by DRB scientists and their counterparts in the US and UK defence research organizations, as well as a range of scientific publications obtained through open academic networks. During 1949–1950, for instance, the DSI’s information section obtained approximately 11,000 documents and distributed 125,000 information cards. Officers also translated two books and fifty scientific research articles from Soviet, German, Japanese, Italian, and Scandinavian sources that year. Copies of the English reproductions ended up with defence organizations in Canada, the US, and the UK. In October 1951, owing to the large and important bulk of work performed by the DSI’s information officers, DND officials detached the Scientific Information Centre from the DSI and created a separate entity under the name of Defence Scientific Information Service (DSIS). Officers in DSIS researched and recorded scientific information with military applications, dealt with newly published books and periodicals, and translated and wrote reports on the scientific and technical aspects of potential weapons and delivery systems.

Scientific intelligence as performed in Canada

Authorities in the DRB first conceptualized Canada’s postwar scientific intelligence mandate in May 1949, three months before the Soviet Union successfully detonated its first atomic bomb and demonstrated its growing threat to Western security. Officers in the newly formed DSI produced a secret report describing the importance of scientific information assessment for Canadian security and national defence, describing the importance of scientific intelligence for forecasting the weapons and warfare potential of enemy countries: “Should we be unfortunate enough to become involved in another war, we are unlikely to be granted the time for preparation after the war starts such as we have had in the past,” the report proclaimed. “The Blitzkrieg has come to stay. The

19. Brandon Webb, “‘How to raise a curtain’: Security, surveillance, and mobility in Canada’s Cold War–era exchanges, 1955–65,” Cold War History 21, no. 2 (2020): 3.
20. The Canadian Army Operational Research Group handed over more than three thousand documents to the new division. See Goodspeed, History of the Defence Research Board of Canada, 78.
21. Reorganization of Headquarters, Defence Research Board – Defence Scientific Information Service, 14 September 1951, file 004–100–74/34–3, vol. 17601, RG 24, LAC. CFIHP collection.
surprises of the next war may be swift, sudden and deadly. We must be prepared for those surprises: to be unprepared might be fatal for us all.”

Owing to the likelihood that any future conflict would be vastly different from the Second World War, this statement laid the groundwork for military preparedness in Canada at the start of the Cold War.

The report also differentiated between scientific intelligence and other forms of intelligence work undertaken by the Canadian armed services and the defence department. “Scientific Intelligence deals with scientists and laboratories, whereas Naval Intelligence, for example, deals with sailors and ships,” the report explained. “But in that part of its work devoted to estimating the future trend of novel weapons, Scientific Intelligence has to leave the realm of today’s facts and can be thought of then as Intelligence Research.”

Despite this clear distinction, DSI intelligence officers persistently reiterated the value and necessity of scientific information assessment for the army, navy, and air force. Logic dictated that scientific intelligence could benefit all three services, thus advancing Canada’s military capabilities and postwar preparedness. From this perspective, DSI officers argued that scientific intelligence was essential for anticipating trends in military warfare. Although intelligence is policy-neutral, Solandt, in his role as DRB chairman, used scientific intelligence and related considerations to recommend government actions and inform Canadian policy in the areas of security and national defence.

Canada’s national defence needs changed drastically as the weapons systems and strategic concepts of the early Cold War evolved, signalling to DRB authorities the increasing importance of generating up-to-date information and analysis about military R&D in the Soviet Union. Facing the possibility of a short and rapidly escalating nuclear war, military and defence officials in Ottawa realized that there would be no time for extensive mobilization of soldiers or industry along the lines of the two previous global conflicts. Under the looming spectre of atomic war, nuclear deterrence replaced mobilization as the primary strategic doctrine of the Western democracies of the free world.

This meant that adequate military preparedness depended on Canada’s ability to produce and supply the weapons, equipment, and information required by the armed services well in advance of any future conflict. As strategic analysts in Ottawa calculated the limits and deficiencies of Canada’s postwar national defence capability, Solandt and his colleagues in the DRB championed scientific intelligence as a fundamental element of military preparedness. The Canadian armed services, they argued, needed the DSI to help generate the scientific and technical knowledge necessary to comprehend the evolving military challenges facing the defence department and the armed services.

22. DRBS 2–0–172-1, Scientific Intelligence DSI 5/49, May 1949, file 9974–A–40 pt. 1, vol. 7900, RG 25, LAC.
23. Ibid.
24. On mobilization, see Dan Middlemiss, “Canada and defence industrial preparedness: A return to basics?” International Journal 42, no. 4 (1987): 713.
The collection of intelligence officers who comprised the DRB’s Directorate of Scientific Intelligence undertook work previously unperformed in the Canadian government, marking the origins of Canada’s scientific intelligence bureau. Pressed by the urgent demands of the Chiefs of Staff, External Affairs, National Defence, and the armed services, they assessed the most up-to-date scientific information available to the Canadian government and made appreciations about the scientific and technological threats of possible future conflicts.Officers in the DSI’s foreign intelligence section studied information about the design and development of new weapons and warfare methods in potential enemy countries, writing research papers about various aspects of atomic warfare for civil defence authorities and the three services. Foreign projects initiated by scientists and engineers in the Soviet Union received the bulk of attention. DSI officers also exchanged information with allied scientific intelligence groups, namely the Central Intelligence Agency in the United States and the Joint Intelligence Bureau in the United Kingdom.

Indeed, the early history of Canada’s scientific intelligence bureau reveals the critical importance of scientific knowledge to national defence and military preparedness. For DSI officers, senior scientists, and military officials in the Canadian defence department, the work of gathering and analyzing information about novel research with real or potential military applications was both logical and necessary. Convinced of the military value of contemporary science and engineering, Canadian authorities in DND saw scientific intelligence as a natural and essential element of the country’s modern defences. Whereas domestic surveillance represented an aggressive form of Cold War security, scientific intelligence was inherently defensive in design. Nevertheless, both approaches served a distinct but interrelated function thought necessary for safeguarding Canadian interests amid escalating tensions between the democratic West and the communist Eastern bloc. As Timothy Sayle has argued, “the primary motivation for continuing and updating Canada’s intelligence structures after the Second World War was the looming spectre of an atomic war.” Science had compounded the problems of modern warfare, simultaneously elevating both the authority and responsibility of the scientist. Canadian officials believed that scientific knowledge was key to defence and military preparedness in a Cold War world—a belief that was manifest in the creation of a functioning scientific intelligence bureau within the defence department.

25. Annual Report of the Chairman, DRB, September 1951, 7, file Speeches - Reporting etc. 1947 – March 1953 volume I, vol. 2425, RG 24, LAC.

26. Occasionally, DSI officers analyzed the probability of war breaking out in targeted locations and expressed their own views and opinions in writing, although such work did not represent DND’s authoritative Canadian position.

27. On domestic surveillance in Canada during the Cold War, see Dennis Molinaro, “In the field of espionage there’s no such thing as peacetime: The Official Secrets Act and the PICNIC wiretapping program,” Canadian Historical Review 98, no. 3 (2017): 457–482.

28. Timothy Andrews Sayle, “The formative years of Canadian foreign intelligence,” Intelligence and National Security 25, no. 6 (2010): 862–867.
As scientific considerations became increasingly important to decision-making processes for postwar Canadian defence, DSI officers thrived in a working environment that depended on the production and exchange of sensitive military knowledge: “The policy for national defence, including defence research, is conditioned at least in part by the nature of the threats of potential enemies,” Solandt wrote in September 1951. “Estimates of those threats together with the means of carrying them out are produced cooperatively by the Intelligence Directorates in NDHQ [National Defence Headquarters] and others, in which task Scientific Intelligence plays and increasingly important role.”

Intelligence officers in the DSI scoured scientific and technical reports produced by universities, research foundations, industry, foreign countries, and military sources. A wide information gathering net provided knowledge useful for planning and refining Canada’s defence against any possible aggression.

Scientific intelligence involved more than gathering and analyzing information about weapons development and military research, however. In the process of collecting and evaluating information about scientific research conducted in enemy states, officers in the DSI’s foreign intelligence section studied the latest developments in foreign science with an eye to informing high-level decision-making processes in the Canadian government. Although scientific research and technological developments in the Soviet Union received the bulk of attention, DSI officers gathered and assessed intelligence about military R&D in all countries other than the United States and those of the British Commonwealth. When a novel weapon or warfare technique passed from the research phase to the development or user-production phase, DSI officers exchanged all applicable information with military officials in the affected service. This applied to scientific intelligence gathered about Canadian geography, because similar military problems existed in the northern regions of Canada and the Soviet Union.

As Cold War tensions escalated in the 1950s, scientific intelligence added to the collection of information senior defence officials relied on to make policy decisions affecting Canadian security and national defence. While it is challenging to establish

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29. Annual Report of the Chairman, DRB, September 1951.
30. Defence Research Estimates and Supplementary Information, “Director General of Defence Research: Progress report for the use of the Minister of National Defence during the presentation of the 1946–47 estimates,” 18 April 1946, 85/334 file 104, box 15, George Lindsey fonds (87/253), Directorate of History and Heritage (DHH), Ottawa.
31. According to the original terms of reference for the Scientific Intelligence Division, officers in the DRB gathered and analyzed information about “a) Defence research organization and establishments; b) Defence research programmes; c) Scientific Order of Battle; d) Total scientific man-power and skills available now and future trends; [and] e) Scientific resources in universities, laboratories, instrumentation and special scientific materials.” See DRB, Scientific Intelligence Division, Organization and Functions, 9 November 1949, appendix B: DRB, Scientific Intelligence Division (Foreign Intelligence Section), file 004–100–74/34–3, vol. 17601, RG 24, LAC. CFIHP collection.
32. One report from October 1953 argued for research into such fields as virology, hallucinogenic drugs, environmental protection in the Arctic, bacterial exotoxins, fuels and lubricant in cold weather, and toxic compounds. See O. Fisher to I. Bowen, 5 October 1953, file DRBS 7–0–240, vol. 4133, RG 24, LAC. CFIHP collection.
clear links between intelligence and policy, DSI officers generated information useful for assessing Canadian military needs against conventional and unconventional threats involving various biological, chemical, and atomic weapons. They stressed the threat of strategic bombers and submarines, for instance, suggesting increased intelligence gathering on the latest research in radar and sonar, radio countermeasures and signals jamming, interceptor fighters, and guided missiles.33 Psychological warfare and deception also represented important topics, highlighting the anxiety-laden circumstances under which scientific intelligence officers conducted their work. Importantly, senior Canadian officials valued scientific appreciations of the latest developments in weapons production and military research for assessing the offensive capabilities of potential enemy countries, and namely the Soviet Union and its satellites.

Scientific intelligence and the Cold War

Scientific intelligence was not unique to Canada, of course. Scientists and government analysts working on both sides of the Iron Curtain understood the importance of gathering information about novel research performed on either side of the divide. Perhaps best epitomized under the pretext of Cold War competition, the superpower rivalry between the United States and the Soviet Union created and sustained R&D opportunities for scientists and engineers engaged in military work. In both countries, the anxiety associated with falling behind the enemy incited financial, institutional, political, and moral support for scientific and technological projects related to the design and development of new weapons and delivery systems.34 Scientists and engineers in Canada also secured extensive funding from government sources, experiencing the pull of military work in a manner reflective of the period.35

From this perspective, the history of scientific intelligence in Canada fits a wider pattern. Smaller powers valued the military knowledge produced by scientific intelligence, often gathering useful information about the weapons capabilities of the United States and the Soviet Union by observing and tracking novel research performed in both states. Scientists working in such countries as Norway and France used scientific networks to understand and respond to American hegemony in Western Europe, for instance.36 As for Canadian authorities in the DRB, scientific intelligence served a similar purpose, though US military power was not a concern. Knowledge about the

33. Ibid.
34. Mark Solovey, “Introduction: Science and the state during the Cold War: Blurred boundaries and a contested legacy,” Social Studies of Science 31, no. 2, Special Issue: Science in the Cold War (April 2001): 165–70; Ethan Pollock, Stalin and the Soviet Science Wars (Princeton, NJ: Princeton University Press, 2006); Naomi Oreskes and John Krige, eds., Science and Technology in the Global Cold War (Cambridge, MA: MIT Press, 2014).
35. Matthew S. Wiseman, “Canadian scientists and military research in the Cold War, 1947–60,” Canadian Historical Review 100, no. 3 (2019): 439–463.
36. Doel, “Does scientific intelligence matter?”
latest scientific research with real or potential military applications in the Eastern bloc informed Ottawa’s assessment of Canadian defence and military preparedness, and the available records suggest that scientific intelligence informed how Canadian officials perceived, approached, and responded to the rapidly evolving military and defence issues of the period.

Although DSI officers attended international conferences and interacted with foreign scientists, espionage was not part of their job description. Instead of relying on covert means to collect information about foreign scientists or research activities, they canvassed open publications, news clippings, and technical reports passed through official diplomatic channels. Accordingly, officers in the DSI’s foreign intelligence section did not collect intelligence in the manner of selected instances involving Canadian diplomat-spies.37 Relying primarily on open academic literature and intelligence shared by allies, scientific intelligence officers used existing knowledge from open scientific sources and restricted reports to forecast the military potential of enemy countries and generate information that senior defence officials could use to inform policy decisions about security and national defence.

This did not preclude the DSI from watching and discussing the work of foreign scientists. In September 1953, for instance, scientific intelligence officer Otto Fisher asked the DRB’s M.G. Whillans about the performance of Soviet scientists at the International Physiological Congress that took place earlier that month in Montreal: “I wonder whether you or any of your group were able to attend their papers or did in any other way have contact with the Russians,” wrote Fisher. “In case anyone in your group took pictures of the Russians we would be very glad if you could please let us have copies of them.”38 Two days later, J. LeBlanc, a DRB physiologist who worked under Whillans in Toronto, wrote a brief memorandum explaining that he had contacted Soviet scientists through an interpreter. LeBlanc spoke with a group of Soviets about their latest research on the cerebral cortex and resistance to cold. The allegedly unsatisfying exchange failed to produce any new information, but the Soviet scientists enquired about LeBlanc’s work with the federal government. When asked about the possibility of visiting DRB laboratories, LeBlanc told the Soviets that civilian scientists seldom gained entry to government laboratories in Canada. The correspondence ended with LeBlanc’s memorandum, and DSI officers chose not to pursue the matter any further.

37. For a documented example of Canadian diplomat-spies, see Don Munton, “Our men in Havana: Canadian foreign intelligence operations in Castro’s Cuba,” International Journal 70, no. 1 (2015): 23–39. See also Miriam Matejova and Don Munton, “Western intelligence cooperation on Vietnam during the early Cold War era,” Journal of Intelligence History 15, no. 2 (2016): 139–155.
38. O. Fisher to M.G. Whillans, Superintendent, Defence Research Medical Laboratories, 16 September 1953, file DRBS 255–25/0, vol. 7440, RG 24, LAC.
Scientific intelligence and the Arctic

American concerns about the Soviet Union influenced the scope and direction of the scientific intelligence activities undertaken by DSI officers in Ottawa. In December 1949, the US Research and Development Board (RDB) produced and circulated a “Strategic Guidance” plan outlining the need to prepare for the possibility of war with the Soviet Union. Under the US National Security Act of 1947, the RDB maintained responsibility for interpreting the research and development strategy of the US Joint Chiefs of Staff. According to the plan, received by Canadian DSI officers in February 1950, American intelligence suggested Soviet warfare capabilities would match and potentially surpass those of the United States by 1955. In response, American military officials strengthened their commitment to scientific intelligence gathering and circulated the strategic plan with the intention of urging Canadian and British authorities to follow suit: “The probable enemy will have atomic bombs and biological, chemical and possibly radiological weapons, and will use them ruthlessly unless deterred by fear of overwhelming retaliation,” argued the RDB. Adequate preparation, the plan continued, meant understanding Soviet capabilities in the air, on ground, and at sea: “[The enemy] will, in addition, use every type of cold-war and guerrilla technique, including propaganda, sabotage, espionage and subversion ... [and] will be able to operate vigorously in cold weather and under usual conditions in the Arctic.”

Intelligence about Soviet scientists mattered, too. Officers in the DSI’s security section monitored foreign scientists who applied for research funding from the Canadian government, as well as scientists and engineers who applied to work in Canada. In January 1949, for instance, Graham Rowley of the DRB’s Arctic Research Advisory Committee requested that P.D. Baird of the Arctic Institute of North America (AINA) forward copies of grant applications and referee comments. Rowley requested copies and comments for research projects conducted by foreign nationals in Canada, excluding citizens of the United States and Commonwealth countries. Hoping to obtain “speedier clearance from the security authorities,” Baird fulfilled Rowley’s request. Rowley acted in response to a decision made by officials on the Joint Intelligence Committee, who agreed, in late 1948, that L.H. Nicholson, Royal Canadian Mounted Police (RCMP) assistant commissioner, would cooperate with the DRB to investigate scientists recommended for grant funding. AINA forwarded the names of sixty-one

39. Research and Development Board, Washington DC, “Strategic Guidance,” 7 December 1949, file DRBS 2–1–172–10, vol. 4117, RG 24, LAC.
40. Ibid.
41. P.D. Baird to Lt. Col. G.W. Rowley, 27 January 1949, file DRBS 106–0–323, vol. 4155, RG 24, LAC.
42. JIC 1–10–2, Privy Council Office, The A/Director of Scientific Intelligence, DRB, “Grants-in-Aid – Arctic Institute of North America,” 8 December 1948, file DRBS 106–0–323, vol. 4155, RG 24, LAC. For information on Nicholson’s wider involvement with RCMP security investigations, see Whitaker and Marcuse, Cold War Canada, 223, 419–420; and Reg Whitaker, Gregory S. Kealey, and Andrew Parnaby, Secret Service: Political Policing in Canada From the Fenians to Fortress America (Toronto: University of Toronto Press, 2012), 215–216, 256.
grant applicants to the DRB that year. Approximately one-third were Finnish nationals expecting to work in northern Canada. Authorities in the DRB then supplied the applicants’ information to the RCMP, along with a memorandum detailing the advertisement of, and review process for, research grants made available through the AINA.

This process continued as Cold War tensions increased, even though there is little evidence to suggest that foreign scientists represented a security threat to Canada. In September 1951, JIC officials voiced their concerns over the possibility of awarding Arctic research grants to scientists from the Soviet Union and Finland:

The Committee realized that it would be embarrassing to the Arctic Institute to have to discontinue Grants-in-Aid to scientists wishing to work in Northern Canada, but felt that such embarrassment might have to be accepted as there was no form of quid pro quo by which Canadian scientists were permitted to work in Russia and possibly Finland. It was agreed to recommend to you [Omond Solandt] that the giving of Grants-in-Aid to scientists from Soviet Russia and Finland for work in the Canadian Arctic was undesirable and should be discouraged.

How firm Canadian officials were on this stance is unclear. Records indicate that the RCMP investigated scientists that AINA nominated for DRB grant funding for work in sub-Arctic and Arctic Canada, but in one particular case, the RCMP identified and cleared a Finnish scientist: “There is nothing in the report on this man to indicate any subversive tendencies,” they concluded. While the details of the investigation are unclear, this case is indicative of a larger pattern. Senior DRB officials prioritized Canadian research to grow Canada’s national capacity for science, seldom funding external projects, but the available records suggest that officers in the DSI’s security section cooperated with the RCMP to monitor foreign scientists who applied for Canadian funding and worked in Canada.

The International Geophysical Year (IGY) of 1957–1958, which saw hundreds of Canadian scientists carry out novel projects at several research establishments across the country, including work on atmospheric physics and the aurora borealis, represented a focal point for DND officials who expressed concern over Soviet research activities in the Far North. The DSI produced intelligence briefs in the years leading

43. R.H. Macdonald, A/Directory of Scientific Intelligence to The Secretary, Joint Intelligence Committee, 17 November 1948, file DRBS 106–0–323, vol. 4155, RG 24, LAC.
44. A.J.G. Langley to Commissioner, RCMP, “Attention: Director of Criminal Investigation,” 19 January 1949, file DRBS 106–0–323, vol. 4155, RG 24, LAC.
45. Chiefs of Staff Committee: Joint Intelligence Committee to the Chairman, DRB, “Grants-in-Aid – Arctic Institute of North America,” 2 May 1949, file DRBS 106–0–323, vol. 4155, RG 24, LAC.
46. Ibid.
47. On Canada and the IGY, see T. Harwood, “The International Geophysical Year,” in Norman Smith, ed., The Unbelievable Land: 29 Experts Bring us Closer to the Arctic (Ottawa: Queen’s Printer, 1964), 114–118; Richard C. Powell, “Science, sovereignty and nation: Canada and the legacy of the International Geophysical Year, 1957–1958,” Journal of Historical Geography 34 (2008): 618–638.
up to the IGY that tracked and reported on the work of scientists like V. Burkhanov, head of the Northern Sea Route Administration, a Soviet administrative entity established in the mid-1930s to manage one of several important shipping routes along the northern and Arctic coast of the USSR. In November 1955, DSI officers recorded and analyzed a Soviet radio broadcast in which Burkhanov outlined the Soviet IGY program for the Arctic, including meteorological, oceanographic, and other scientific investigations planned for the Soviet Arctic fleet and stationary polar stations located north of the USSR.48 Whether scientific intelligence briefs on Burkhanov informed policy-level discussions for assessing the Soviet threat in the Arctic is unclear, but DSI officers produced a large body of work as part of Canada’s precautionary and wide approach to intelligence.

Canadian scientific intelligence on Soviet nuclear activities culminated in a series of secret DSI reports produced during the mid-to-late 1950s that documented and analyzed both the peaceful and military aspects of the USSR’s atomic energy program.49 DSI officers documented and assessed the physical infrastructure of the Soviet Union’s nuclear capability as well as the institutes, laboratories, and large pool of scientists who carried out research on nuclear power, marine and aircraft propulsion, thermonuclear weapons, radioactive fallout, and other areas of atomic research. The Joint Institute of Nuclear Studies at Dubna, located about 100 kilometres north of Moscow, received extensive attention from DSI officers, as did well-known Soviet physicists like V. I. Veksler and M. A. Markov, who studied high-energy physics and theoretical physics, respectively.50

Scientific knowledge about the physical environment and the atomic threat was utilitarian in principle, of course. Military technologies required accurate information to function effectively and efficiently, a notable example of which being the continental radar network constructed in northern Canada and the Arctic. As historian Matthew Trudgen has explained, top Canadian officials believed that radioactive fallout from a thermonuclear conflict with the Soviet Union would render early warning systems ineffective for air defence.51 But authorities in DND had other concerns as well, and scientific intelligence was an important tool in helping Canada and its North Atlantic partners to comprehend the full scope of the Soviet nuclear threat. For instance, the DSI coordinated and guided a radioactive debris sampling program in the late 1950s and early 1960s to obtain fission samples from foreign nuclear explosions for analysis in Canada and the UK. The program’s main aim was to provide information on the type and size of Soviet nuclear detonations, which, in theory, could be determined from the radioactive elements found in the atmosphere. Although records about the program remain closed, available information suggests that debris-collection flights by the

48. Intelligence Brief, Soviet Plans for Research in the Arctic, 15 November 1955, file 50028–BC–40 Part 8, vol. 7943, RG 25, LAC. CFIHP collection.
49. For instance, see DSI Report No. 4/59, The Soviet Atomic Energy Program: Peaceful Uses, June 1959, file 2003/7, DHH. CFIHP collection.
50. Ibid.
51. Matthew Trudgen, “Coping with fallout: The influence of radioactive fallout on Canadian decision-making on the Distant Early Warning (DEW) Line,” International Journal 70, no. 2 (2015): 232–249.
RCAF obtained samples useful for scientific intelligence about the Soviet nuclear weapons program and military threat.\footnote{Nuclear Explosions: Canadian Debris Sampling Programme, 18 June 1958, file 9974–A–40, vol. 7223, RG 25, LAC; Canadian Nuclear Debris Collection Program, 23 July 1962, file 1216–J2–3 Pt. 5, vol. 12873, RG 24, LAC. CFIHP collection.} Other types of scientific intelligence supported defensive military planning as well, including information to improve the accuracy of guided missiles or the manoeuvrability of submarines under sea ice in the Arctic Ocean.

As the Cold War intensified, DSI officials remained steadfast in their conviction that scientific intelligence on the Arctic, including novel R&D projects and the activities of foreign scientists, held practical value for Canadian military preparedness. In December 1960, Canada’s director of scientific intelligence L. Guy Eon wrote to convince his DRB colleagues of the continuing (and in his estimation, growing) need to gain knowledge of northern research activities undertaken by Soviet scientists and engineers:

One of the requirements which DSI should meet is the gathering and assessment of information on Soviet research activities in the North. Because Canada and the USSR occupy similar geographical areas and thereby share problems typical of very cold climates, the US and the UK look to Canada for advice on defence problems specific to high latitudes. While DRB as a whole carries out R&D on the northern environment and its effects on military equipment and operations, DSI should evaluate parallel work in the USSR.\footnote{L. Guy Eon, Intelligence on Arctic Research and Development, 9 December 1960, file DRBS–9500–90–4, vol. 7567, BAN 1983–84/167, RG 24. CFIHP collection.}

Confident that gathering scientific intelligence about Soviet research activities in the northern USSR and the Soviet Arctic “would pay dividends in our relations with the US and the UK intelligence agencies,” Eon recommended geographer Moira Dunbar for the job.\footnote{Ibid.} A glaciologist by training who flew over the Arctic islands north of the Canadian mainland photographing topography several times in the 1950s with RCAF pilot Keith Greenaway, Dunbar had broad knowledge of Arctic research and could read and translate Russian-language sources.\footnote{Moira Dunbar and Keith R. Greenaway, Arctic Canada from the Air (Ottawa: DRB, 1956).} She ultimately performed the proposed work for the DSI on an informal basis, regularly studying Soviet Arctic research activities, and periodically translating Russian sources or answering queries about the scientific information she read and interpreted.\footnote{Memorandum re: Intelligence on Arctic Research and Development, 19 December 1960, file DRBS–9500–90–4, vol. 7567, BAN 1983–84/167, RG 24. CFIHP collection.}

\section*{Conclusion: The development of scientific intelligence in Canada}

While the origins of Canada’s intelligence apparatus predate the Cold War, the evolving military threat that emerged after the Second World War required a concerted response
involving multiple branches of the federal government. In the immediate postwar years, Canadian intelligence focused on domestic security, counterespionage, and foreign affairs.\textsuperscript{57} Operating under the assumption that cooperation and exchange with the United States and the United Kingdom was essential to security and national defence, officials in Ottawa created a robust intelligence network. In a system designed to gather and protect information valuable for strategic military planning, scientific intelligence became integrated into Canada’s national intelligence regime. DSI officers gathered and analyzed information about the new and evolving weapons systems of the Cold War, using existing intelligence networks and threat assessment to help decision-makers in the defence department comprehend the complex techno-military challenges facing Canada and the North Atlantic security partners.

In November 1965, as part of the integration of National Defence Headquarters, DND officials removed the DSI from the DRB and placed Canada’s scientific intelligence bureau under the authority of a newly created Director General Intelligence (DGI). The move combined the DSI with the technical intelligence sections of the existing service intelligence directorates to form the Directorate of Scientific and Technical Intelligence (DSTI).\textsuperscript{58} Integration gave DSI officers increased responsibility for the scientific and technical problems of External Affairs, the Atomic Energy Commission, and other government departments. At the same time, Eon assumed responsibility for a larger bureau comprised of scientists and technical military officers.\textsuperscript{59} Thus, Canada’s relatively small group of scientific intelligence officers gained heavier workloads and decreased time to devote to the important work that they had focused on for more than fifteen years. Moving forward, the function of scientific intelligence in Canada occurred within Ottawa’s military intelligence organization, rather than as part of the DRB. The DSTI provided the Canadian government with a unique capability in the field of scientific and technical intelligence, signalling the importance of studying the DSTI’s role and activities in future research.

Understanding how and why the structures of Canada’s scientific intelligence bureau developed as they did after the end of the Second World War is a challenging task, but this topic should interest scholars of intelligence, the history of science, and Western defence and military preparedness in the earliest decades of the Cold War. The work of Canadian scientific intelligence officers generated information deemed useful to the strategic considerations of senior military and defence officials in Ottawa tasked with informing policy decisions about the country’s top security and defence issues.

\textsuperscript{57} Signals intelligence was also important for Canadian security and national defence, as historical scholarship about Canada’s postwar intelligence regime illustrates. See Philip Rosen, “The Communications Security Establishment – Canada’s most secret intelligence agency,” (Ottawa: Library of Parliament, Parliamentary Research Branch, 1993); Martin Rudner, “Canada’s Communications Security Establishment, signals intelligence and counter-terrorism,” Intelligence and National Security 22, no. 4 (2007): 473–490.

\textsuperscript{58} L.G. Eon, 19 October 1965, file DRBS–255–35/7, vol. 7440, RG 24, LAC. CFIHP collection.

\textsuperscript{59} L.G. Eon, Integration of DSI with DGI, 24 September 1965, file DRBS–255–35/7, vol. 7440, RG 24, LAC. CFIHP collection.
Although it is difficult to draw clear links between intelligence and policy, knowledge and analysis of scientific and technological research carried out in the Soviet Union and its satellite states helped senior Canadian defence officials understand and respond to pressing issues involving Canada’s postwar military preparedness.60

Although defence research and intelligence during the early Cold War period were not one in the same, senior military and defence officials in Ottawa often leveraged the important work of DRB scientists and DSI officers toward the same ends. Research about northern Canada and the Arctic held value for Canadian security and national defence, especially as applied to the design and development of defensive technologies, and scientific intelligence officers in DND drew relevant knowledge from copious sources of information, including classified military reports and open publications. Ultimately, the high demand for military knowledge supported and sustained the structures required of a functioning scientific intelligence service, suggesting that top Canadian officials approached the country’s military preparedness issues of the atomic age under the assumption that science was both a problem and a solution.

Declaration of conflicting interests

The author declared no potential conflicts of interest with respect to the research, author-ship, and/or publication of this article.

Funding

The author received no financial support for the research, authorship, and/or publication of this article

ORCID iD

Matthew S. Wiseman  https://orcid.org/0000-0002-3166-6943

Author biography

Matthew S. Wiseman is a Lecturer in the Department of History at the University of Waterloo. He attained a PhD in History from Wilfrid Laurier University in 2017 before holding successive post-doctoral fellowships at the University of Toronto (2017-19), Western University (2019-20), and St. Jerome’s University (2020-22) His research on the history of science and technology in Canada has appeared in books and scholarly journals, and he is the author of a forthcoming monograph on the history of science in northern Canada and the Canadian Arctic during the early Cold War.

60. Historian Paul Robinson has argued that intelligence does not improve policymaking, an assertion derived from a close study of Canadian foreign intelligence. See Paul Robinson, “The viability of a Canadian foreign intelligence service,” International Journal 64, no. 3 (2009): 703–716.