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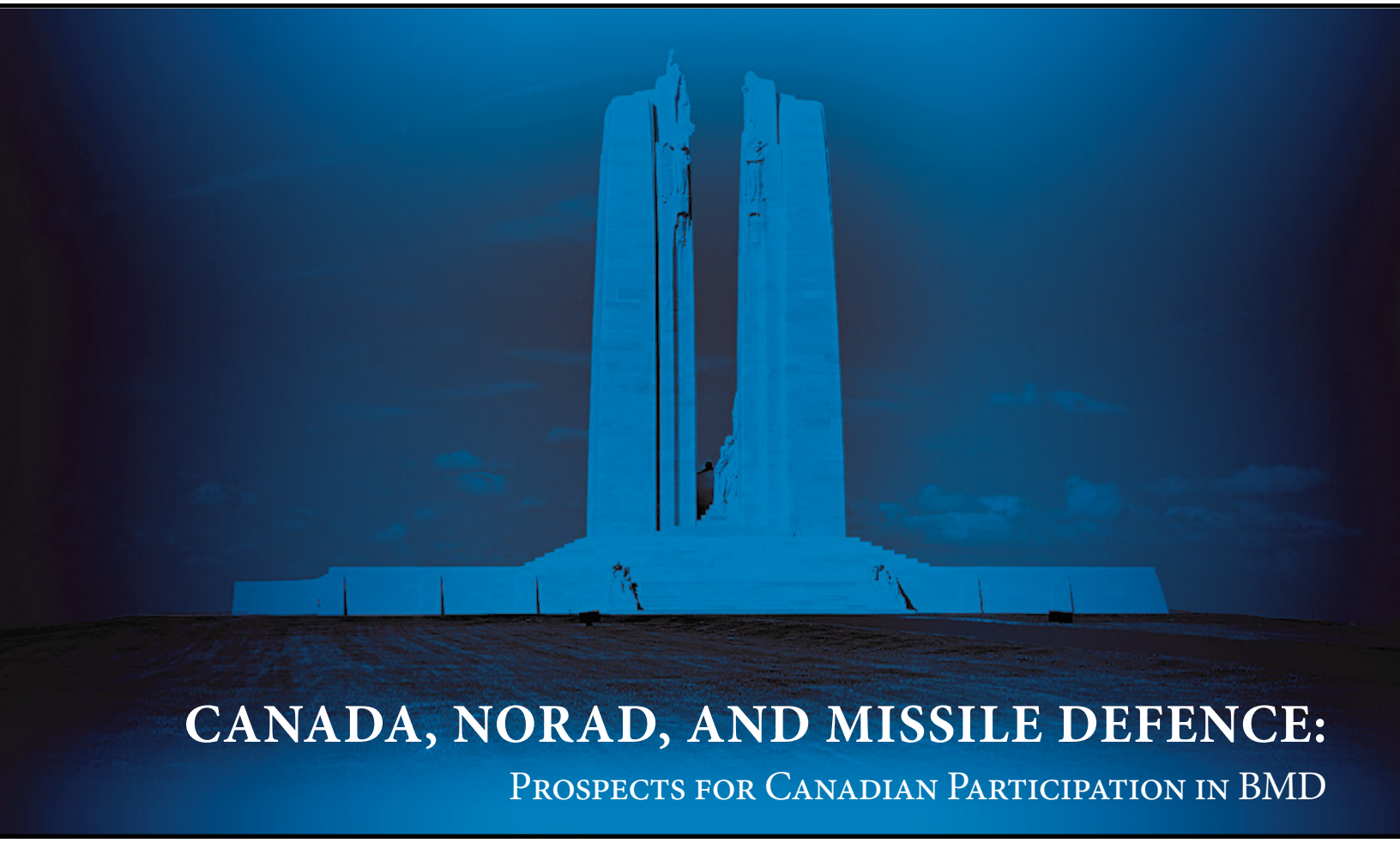

CANADA, NORAD, AND MISSILE DEFENCE:

Prospects for Canadian Participation in BMD

David S. McDonough

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Conference of Defence Associations Institute

151 Slater Street, suite 412A
Ottawa, Ontario K1P 5H3
613 236 9903
www.cdainstitute.ca

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David S. McDonough, PhD

Research Manager & Senior Editor,
CDA Institute

Research Fellow, Centre for Foreign Policy
Studies, Dalhousie University

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EXECUTIVE SUMMARY

The Canadian government recently launched its Defence Policy Review, expected to be completed by early 2017. The Department of National Defence also released a consultation paper that offered an overview of the issues facing the Canadian Armed Forces and key questions meant to guide public consultations as part of this review process. Of note, the document raised the previous government's 2005 decision to refuse participation in the US ballistic missile defence (BMD) system, and asked whether it was time to revisit this decision "given changing technologies and threats?"

This Vimy Paper explores the debate about Canada's possible participation in US missile defence plans, and assesses the advantages and possible disadvantages of such a commitment. The paper begins by examining the Canadian role in the North American Aerospace Defence Command (NORAD), particularly the implications if NORAD fails to be directly involved in BMD. It then looks at the possibility of Canada receiving some protection in a BMD system, possible scenarios in which such protection would be required, and the likely contributions necessary if Canada wants to participate in missile defence and receive a modicum of protection. Lastly, the paper disentangles and assesses some of the key arguments used by critics against BMD.

By directly participating in BMD, Canada would reinforce the status of NORAD, strengthen the Canada-US defence relationship, and potentially ensure an important element of protection against ballistic missile threats. Canada will likely have to offer an "asymmetrical" or "in-kind contribution" if it hopes to receive protection afforded by the BMD system, so the question of cost needs to be further assessed. Lastly, criticism of BMD have often been either overstated or hampered by a degree of logical inconsistency or dissonance. As the Vimy Paper concludes, for these reasons, Canada should begin discussions with the United States on this issue – to better ascertain the costs Canada may be expected to shoulder for participation and ultimately to become an official participant in BMD.

SOMMAIRE

Le gouvernement du Canada a tout récemment initié une revue de la politique de la défense qu'il espère compléter au début 2017. Le Ministre de la défense nationale a également émis un document de consultation dans lequel il fournit un aperçu des sujets d'importance aux Forces armées canadiennes ainsi que des questions ayant pour but d'orienter et inciter le grand public à contribuer à cette consultation.

Entre autres sujets, l'auteur de ce 'cahier Vimy' soulève la question du refus du gouvernement précédant, en 2005, de participer au système américain de défense antimissiles balistiques (DAB) et demande si, compte tenu des nouvelles technologies et des nouvelles menaces, il ne serait pas utile de repenser cette décision. L'auteur se penche aussi sur le débat entourant la possibilité d'une participation canadienne à ce plan américain et évalue les pours et les contres d'une telle décision. Il examine d'abord le rôle du NORAD sous une éventuelle décision de non-participation du NORAD au DAB pour ensuite se pencher sur la protection qu'accorderait le DAB au Canada. Il exploite ensuite certains scénarios selon lesquels cette protection serait souhaitable pour ensuite examiner la contribution que le Canada aurait à faire au DAB dans le but d'en obtenir une protection minimale.

Ce document présente aussi certains arguments contre une participation canadienne au DAB. En contre partie, il explique qu'une participation pourrait avoir un effet positif sur le statut du NORAD; saurait renforcer la relation Canada-États-Unis; et pourrait offrir une protection certaine contre les menaces de missiles balistiques.

L'auteur termine en suggérant que le Canada devrait entreprendre des pourparlers sérieux avec les États-Unis afin de bien comprendre les coûts associés à une participation au DAB.

INTRODUCTION

The Canadian government recently launched its long-promised Defence Policy Review, expected to be completed by early 2017. As part of this process, National Defence released a consultation paper that offered an overview of the issues facing the Canadian Armed Forces (CAF) and key questions meant to guide public consultations. Of note, the document raised the previous Liberal government's 2005 decision to refuse participation in the US ballistic missile defence (BMD), and asked whether it was time to revisit this decision "given changing technologies and threats?" As it continues, "Would a shift in policy in this area enhance Canadian national security and offer an avenue for greater continental cooperation? Or are there more effective areas in which to invest to better protect the North American continent?"[1]

It remains to be seen whether the inclusion of BMD in this consultation paper is indicative of a renewed interest in reassess Canada's participation or in fact a red herring meant to give the appearance of consideration.[2] The current government has certainly been coy on the issue, unlike the Conservative government that hinted on multiple occasions about possibly revisiting the 2005 decision.[3] Yet, beyond saying its options remained open on this issue, the previous government never actually initiated any movement to renew discussions with the United States on BMD – and questions about what it would have done had it been re-elected are now moot.

Still, it would not be totally unexpected if the Liberal government opted to reassess the merits of staying out of BMD. In 2014, two prominent Liberals, former defence ministers David Pratt and Bill Graham, testified to the bipartisan Standing Senate Committee on National Security and Defence on the need to reverse the highly politicized 2005 decision. The bipartisan Committee itself released a report, authored by Chair Daniel Lang (Conservative) and Deputy Chair Roméo Dallaire (Liberal), strongly and unanimously recommending that Canada play a role in missile defence, which provided some political cover for the then Conservative government's pre-election musings on this issue.[4]

Given the government's Defence Policy Review, it seems an opportune time to revisit the debate about Canada's possible participation in US missile defence plans. Decisions on such an issue require a thoughtful, deliberate, and fair assessment on the advantages and possible disadvantages of such a commitment. By directly participating in BMD, Canada would reinforce the status of the North American Aerospace Defence Command (NORAD), strengthen the Canada-US defence relationship, and potentially ensure an element of protection in the event of a ballistic missile attack. While the cost of participation should not be overlooked, the consequences that critics tend to fear have often been overstated. As such, it is time after a decade-long interlude for Canada to once again invite its neighbour to discuss missile defence – and, with luck, hopefully this "dance" will have a better ending than that which took place in 2005.[5]

MISSILE DEFENCE AND NORAD

First of all, the notion that Canada's role in NORAD, and indeed the future of the binational command, is somehow in jeopardy if it does not participate in BMD should be put to rest. This danger was an unspoken consideration during the brief operational life of the Sentinel anti-ballistic missile (ABM) system. It existed in the 1990s as well, following the end of the Soviet air threat to the continent. This led to NORAD's search for a new *raison d'être*, including involvement (still ongoing, but with a greatly reduced focus) in counter-narcotics operations – although BMD was seen as the primary way to 'save NORAD.'

NORAD then faced the immediate post-9/11 world with some trepidation. Senior US officials were "shocked and dismayed"[6] to learn that a Canadian was in charge of NORAD at the time of the attack; US Space Command (SPACECOM) was separated from NORAD and its responsibilities folded into Strategic Command (STRATCOM);[7] a new command in the form of Northern Command (NORTHCOM) was twinned with NORAD at Colorado Springs, which raised the possibility that some of NORAD's key functions such as early warning could be transferred to the US-only command;[8] and the United States had reportedly offered to expand NORAD into a North American Defence Command, which Canada politely declined.[9]

Both countries moved instead to nationalize their command structure, through NORTHCOM on one hand and Canada Command (which was merged with Expeditionary Force Command and Operational Support Command to form Canadian Joint Operations Command in 2012) on the other. A Binational Planning Group (BPG) was formed and co-located in NORAD from 2002-2006 to explore different military contingency plans and offer recommendations on Canada-US continental defence relations. Four recommendations were placed on the table, three of which envisioned greater levels of cooperation. Yet most of its recommendations were never acted upon and the report itself has since become largely forgotten – although NORAD's additional role in maritime warning can be seen as arising from the work of the BPG.

Despite such possible warning signs, the end result to NORAD has been largely positive. The reason was simple. The renewed importance of airspace warning and control after 9/11 – given the threat of internal air-breathing threats like hijacked aircraft being used weapons – had effectively safeguarded the NORAD institution and Canada's role within it.[10] Operation *Noble Eagle*, initiated in the immediate aftermath of 9/11 to prevent a similar type attack, evolved into a more targeted, enduring and still ongoing mission, with NORAD routinely providing coverage of important events, like the 2010 Vancouver Olympics. New links with civilian agencies like Nav Canada and the US Federal Aviation Authority

(FAA) were established to gain a better operating picture of the internal air threat, and streamlined rules of engagement were implemented.[11]

Recognition of the continuing importance of the command in both countries can be found in the decision to indefinitely renew the NORAD agreement and the expansion of its responsibilities to maritime warning. Despite concerns about its creation, even the stand up and co-location of US NORTHCOM with NORAD proved to be beneficial. After all, NORTHCOM tied NORAD even more closely to the broader (and increasingly important) US homeland defence mission while paving the way for an array of military and civilian intelligence inputs necessary for NORAD's new maritime warning mission, including the US Navy (and especially US Fleet Forces Command), the US Coast Guard, as well as civilian agencies in the Department of Homeland Security, among others.[12] Despite initial scepticism about the maritime warning mission, not least by traditional maritime actors that saw NORAD as an "outsider," the command has since emerged as a key facilitator for greater maritime security cooperation and a valuable mechanism to provide a North American perspective on maritime domain awareness.[13]

However, in the absence of Canada's participation in missile defence, this does not mean NORAD's current importance and mission requirements – aerospace warning (both air and space), airspace control (limited to defence against air-breathing rather than aerospace threats), and maritime warning (but not control) – are all necessarily secure in the long-term.

This uncertainty arises from NORAD's awkward post-2004 position, in which the command is involved in the early warning of a ballistic missile attack but not in the interception of such a missile. In 2004, Canada had agreed for NORAD's integrated tactical warning and attack assessment (ITW/AA) functions to be used in the Bush administration's soon to be operational ground-based midcourse defence (GMD) system, assigned to NORTHCOM. This decision helped to safeguard NORAD's continuing role in ballistic missile warning and its existence as an *aerospace* – as opposed to an airspace – defence command, while ensuring that its decision on BMD in 2005 was more palatable and indeed inconsequential to US interests.

Yet NORAD is no longer alone in its early warning functions. A number of new fixed and mobile X-band radar assets provide tracking and cueing capabilities, and these are not necessarily linked to NORAD – as these sensors feed information to a range of ground and sea-based systems beyond GMD.[14] In other words, NORAD is no longer the only game in town for ballistic missile early warning. One should also note the logic of finally integrating early warning directly into BMD, given the compressed time requirements for interception and the maturing state of the US missile defence architecture.[15] If Washington ever chose another conduit for early warning, one of the binational command's key missions would be at

an end. This might not be an existential threat to NORAD, but it does ultimately raise questions about the command's importance.

But, even here, it is a matter of some debate. Some would emphasize the benefits that could be accrued by Canada's continued participation in NORAD's ballistic missile early warning role, which provides a window into US strategic thinking, defence planning, and military space developments.[16] Others would raise issues on what vital information relevant to Canadian interests is ultimately acquired from the NORAD aerospace warning conduit.[17] In the latter perspective, while a change in NORAD's mission away from aerospace warning might be a concern, it need not be a fundamental issue for Canadian decision-makers. NORAD's role in air defence and maritime warning would still remain salient, and there is always the possibility the command could expand its role into other areas, such as working to achieve all-domain awareness in the Arctic.

Indeed, it is all too easy to be fixated on NORAD and forget the numerous agreements that tie the two allies together – from the Permanent Joint Board of Defence to the Military Planning Committee to the high-levels of interoperability and close working relationship between the military services of both countries. Even if NORAD was in jeopardy, it would not mean the Canada-US strategic relationship was also in danger, or that a binational command like NORAD could not be recreated if global circumstances ever warranted it.[18]

That being said, there is no denying that Canada should be concerned by the possibility that NORAD might face at least a curtailment in its aerospace role, owing to Canada's absence from the GMD system deployed in North America. By allowing NORAD's tactical early warning and attack assessment functions to be used in this missile defence system, Canada did safeguard the command's aerospace role – but likely not in perpetuity. Of course, by itself, this might not be reason enough for the country to play a role in missile defence. But it is certainly an important consideration in Canada's national interest – and the defence policy review process needs to take that into account.

MISSILE DEFENCE AND THE PROTECTION OF CANADA

Canada's refusal to participate in GMD has also created a curious anomaly, given that key allies in NATO, the Asia-Pacific, and elsewhere – including the UK, France, Germany, Australia, Japan, South Korea, Israel, among others – have moved quickly to develop and deploy missile defences, often in close cooperation with the United States. Canada is placed in a particularly awkward position as a member of NATO. While remaining outside of the continentally-focused GMD system, Canada effectively supports the alliance's efforts at developing a BMD system capable of defending both deployed military forces *and*

European population centres – a goal first outlined in NATO's *2010 Strategic Concept* and reiterated in its *2012 NATO Deterrence and Defence Posture Review*. An interim operational capability was declared at the Chicago Summit in 2012, and the system itself is expected to become fully operational in 2025.

Missile defence over NATO-Europe will be reliant on the national radar and interceptor assets of individual NATO members earmarked for the alliance's Active Layered Theatre Ballistic Missile Defence, as well American assets under its European Phased Adaptive Approach.[19] The latter relies on Aegis and Aegis Ashore BMD systems using variants of the Standard-Missile (SM), designed to intercept shorter-range ballistic missiles, rather than GMD's ground-based interceptors (GBIs) against the intercontinental ballistic missile (ICBM) threat used in North America. But NATO will have a commonly funded command structure, one that Canada can be expected to contribute.[20] In this way, Canada has apparently accepted the logic of missile defences for its allies in Europe, but not for its own continent.

Canada's anomalous position raises a crucial question that goes to the heart of whether the country should participate in missile defence – and that is the possible protection from ballistic missile attack afforded to our allies, due to their BMD deployments and/or participation in the US missile defence architecture, and which Canada may lack from refusing participation here at home. If discussion about NORAD is largely about interest, this issue touches on the very security of Canada's populace and territory.

It is often falsely assumed that Canada would, irrespective of its position or lack of open involvement, be protected from the American GMD system by virtue of its geographic location and cross-border interdependence and integration with the United States – what R. J. Sutherland had said made for a "single target set" over fifty years ago.[21] Yet, today, a BMD system can identify a ballistic missile trajectory and better distinguish between an attack against a Canadian target and one that would land in the continental United States. This situation is fundamentally different from the air defence mission during the Cold War, when a Soviet bomber attack would have to traverse the Canadian North before reaching the United States, making it necessary to halt an attack before it was in range of both US *and* Canadian population centres.[22] Canada cannot therefore assume that it can rely on a US missile defence system to protect its territory from a ballistic missile attack.

The United States might have an interest in protecting its northern neighbour, given the inevitable fallout (from radioactive to economic) that would arise from a nuclear-armed ballistic missile attack on Vancouver or Toronto. But that interest would then have to be weighed against the possibility of an attack on the US homeland itself. It also needs to be considered in light of the limited number of interceptors available – expected to reach 44 GBIs by 2017 at Fort Greeley, Alaska and Vandenberg Air Force Base, California – as well as the few interception opportunities available against ICBMs. After all, with its shoot-look-shoot

doctrine, the United States expects to fire a salvo of five interceptors for each target, undertake rapid assessment or success or failure, and then follow-up with another interception attempt, if possible (and time permitting).[23] The US may therefore increasingly see a trade-off in protecting a Canadian city over an American one, especially as its warhead tracking capabilities improve.

Of course, this is not to deny the low likelihood of such a scenario, especially given the prospect of an American response (possibly nuclear) if a country like North Korea or Iran succeeded in developing nuclear-armed ICBM and launched such an attack. Yet such a threat remains an increasingly possible means for such a regime to minimize America's coercive leverage against them.[24] For example, Pyongyang might then take the calculated risk of limited conventional regional aggression against one of its neighbours, relying on its capacity to undertake nuclear blackmail and brinkmanship in order to deter the international community – and specifically the United States – from intervening to restore order.[25] Indeed, North Korea has not only conducted multiple nuclear tests (2006, 2009, 2013, and 2016), but also has an active ballistic missile program that may be capable of flight-testing a working ICBM (the road-mobile KN-08) by next year.[26] The possibility that Pyongyang might have the capacity for such nuclear blackmail is increasingly less hypothetical.

The United States may hope that its own nuclear retaliatory capabilities could dissuade a country like North Korea from acting in such a manner, and be sufficient for intra-war deterrence in the event that the US military intervenes. Yet the intra-war deterrence of such potential regional aggressors in the midst of a possible military intervention or regime change campaign is extremely difficult, if not altogether impossible.[27] Coercive nuclear escalation would be a tempting option for a weak state facing the possibility of "catastrophic conventional defeat," when the "superpower's planes are bombing command and leadership sites, and when its tanks are seizing territory."[28] And the US would still face the imbalance in resolve that often arises in any extended deterrence scenario. Simply, Washington may be ill-inclined to risk the possible destruction of Seattle to save Seoul.

By offering some "damage limitation" insurance, a continental BMD system provides a way for the United States not to be held hostage to such a situation, making it more willing to act in crises and less able to be deterred or coerced by the nuclear blandishments of regional aggressors. In effect, it would buttress its deterrence-by-denial posture against potential adversaries that might not see punishment as sufficiently credible. Missile defences would also reinforce US extended deterrence guarantees to its allies, by reassuring allies that the United States would not be deterred by an aggressive neighbours' threat of nuclear blackmail from "fulfilling its alliance commitments."[29] This might help dampen any allied inclination to either develop their own deterrent or act pre-emptively or preventively against such threats. Also often forgotten is that the United States would not be so reliant on the use of its nuclear arsenal as

well, thereby injecting some much needed stability in any future crisis situation.[30]

Such a scenario remains perhaps most acute with North Korea but it is also a possibility with Iran, even following its recent signing of a nuclear deal. The Joint Comprehensive Plan of Action (JCPOA)[31] resulted in a significant reduction of Iran's enriched uranium stockpile, curtailed its capacity to enrich uranium by cutting the number of centrifuges, and established safeguards and verification measures that would give advance notice of cheating. Rather than eliminating the program, Iran was allowed to retain a frozen nuclear program, albeit one greatly constrained, partially dismantled, and with a breakout time to build a nuclear bomb extended from a few months to one year.[32] Still, JCPOA may have only delayed Iran's nuclear program by a decade, in which time its ballistic missile development efforts will be considerably advanced. Development on Iran's *Sajjil*-2 solid-fueled medium-range missile remains ongoing, and former weapon inspectors like Michael Elleman argue that a follow-on intermediate-range missile than can target Western Europe could appear as early as next year, undoubtedly aided by Iran's work on the *Safir* space launch vehicle. With Iranian work on satellite launch technology, Elleman further estimates a possible ICBM by the end of the decade.[33]

Canada cannot ignore the possibility that North Korea or Iran (and possibly others in the future) may acquire the means to launch nuclear-armed ballistic missiles against North America over the next decade. It should also not discount the possibility that the United States may find itself in direct conflict with such regionally aggressive states, which would open up more credible scenarios of a nuclear attack on the continent beyond a simple "bolt-out-of-the-blue." Canada is unlikely to remain isolated from such incidents either, given the direct and indirect consequences of an attack aimed at the United States, not to mention that Canada may be seen as a safer and softer target by aggressive states eager to demonstrate resolve and warn the United States against intervening. Canada is in the "second inner ring" if not the "bullseye," to borrow a phrase used by Senator Colin Kenny.[34] With that in mind, Canadians might indeed find itself out in the cold in the event of a ballistic missile attack on North America – a very low-probability scenario to be sure, but one with potentially catastrophic consequences that cannot be discounted entirely.

Missile Defence and Its Cost

If Canada is conceivably exposed to such a potential threat, this does not mean that solving this issue will be easy. One should not assume that Canada just needs to inform Washington about revisiting this issue, and reap the protective benefits of participating in BMD. Simply put, it is not at all clear why the United States would be so eager for Canada to participate in BMD. What does Washington really have to gain by involving Canadians more directly in missile defence today? The answer to this question hinges on something Canadian defence planners are likely loath to discuss, especially given the current budgetary shortfalls and big-ticket defence procurement projects on the horizon – and that is the matter of the ex-

pected cost for Canada's participation.

One should recall that the United States had always been reluctant to give Canada a guarantee of protection under the BMD system or a say in the intercept planning process itself. With the US adamant about keeping command and control of BMD strictly in American hands, input into intercept planning was the only mechanism for Canada to secure some degree of protection, by ensuring Canadian cities are on the interception priorities list for the system, for example. Even then, however, the US negotiators in 2004 to 2005 showed little interest in giving Canada input in the interception algorithm – and the resultant draft Memorandum of Understanding, meant to lead to Canada's participation, still only promised that "potentially input might be secured in the future."[35]

With this in mind, it seems somewhat incredulous that Canada would secure participation and protection in a BMD system, as defined by having input in the interception process, without some form of contribution as a quid pro quo. True, Canada had benefited from NORAD's ballistic missile early warning role, despite having no assets contributing to this mission from 1992 until 2013 when Canada's Project Sapphire satellite was launched.[36] However, given its evident reluctance in 2005, it seems doubtful that such a fortuitous circumstance and indeed generosity on the part of the American side – due to their "habit" of working with the Canadians, according to senior official in Canada[37] – will continue when it comes to missile defence. The use of existing Canadian personnel at NORAD may be sufficient for Canada to officially participate, as scholar Philippe Lagassé has argued.[38] But, if it hopes to achieve *substantive* involvement, and therefore gain some surety of protection under BMD, more will be needed.

Canadian policy-makers have certainly long understood the need to make an "asymmetrical" or "in-kind contribution" to missile defence. Yet little is really known about the likely cost of participation, and whether it will entail a financial support for the system or can be limited to being in-kind, such as the use of Canadian territory for BMD assets. American officials have been coy on spelling out the cost until their Canadian counterparts agreed to participate, while Canada had long insisted the need to know the cost before agreeing to participate – an impasse that has so far never been broken.

One "in-kind" possibility often cited has been for Canada to offer a site at Goose Bay, Newfoundland, which would be an ideal location for an X-band tracking and cueing radar geared towards the expected flight path of an Iranian ICBM. The current US missile defence system for North America, located in Alaska and California, is designed to shoot down a North Korean missile, so such a facility could prove useful in filling a radar coverage gap – especially if the United States decides to build a third interceptor site aimed at Iran's potential long-range missile capabilities on its East Coast, which would increase the possibility of undertaking a second intercept attempt. The United States has been conducting environ-

mental and cost assessments of possible locations for a third site over the past few years.[39]

The expected cost for such a contribution is difficult to determine, although some say it can be as low as $500 million in maintenance costs, with the radar itself to be supplied by the United States.[40] Yet much depends on the US willingness to shoulder the primary financial burden of this facility, which in itself depends on its perception on the salience of an Iranian nuclear and ballistic missile threat. On that point, while JCPOA might have temporarily alleviated the nuclear threat, it has done little to decrease fears about Iranian ballistic missile capabilities, as shown by Washington's reaction to the increased tempo of Iranian ballistic missile development, including ballistic missile tests in October-November 2015 and March 2016.[41]

Other potential in-kind contributions have also been raised. For instance, American military officials – not least the Commander of NORAD and NORTHCOM Admiral Bill Gortney – have shown interest in having multi-purpose sensors in the Arctic, which would be capable of tracking aircraft, maritime vessels, and cruise and ballistic missiles.[42] One clear advantage is that these continental surveillance radars, which defence scientists at Defence Research and Development Canada are currently researching,[43] would have multiple uses beyond simply BMD in a region where all-domain awareness will become increasingly needed for both security and sovereignty.

Yet such a system, reliant on multiple assets in an unforgiving environment, would assuredly be more expensive than a single site at Goose Bay. Even here, however, there are reasons why this option could gain traction. First, it would be used to replace an already existing line of radar stations, the North Warning System (NWS), which is near the end of its service life.[44] The NWS needs to be either replaced or modernized in any event, so it might be tempting to use this opportunity to provide an in-kind contribution to the GMD system. Second, since it has multiple uses beyond aerospace warning and control, such a radar line could benefit additional actors and agencies apart from NORAD – thereby opening up the number of operational stakeholders who may be asked to provide funding. Third, by linking the replacement for the NWS to BMD, Canada may hope that it would be able to entice the United States to cover the high expect cost of this project, much as Canada had done in the Cold War.

Another possibility is to eschew land-based proposals altogether and to focus instead on possible space-based assets. The potential for such a contribution was demonstrated by the launch of the Project Sapphire satellite, which contributes to the US Space Surveillance Network. The satellite might not be designed to track ballistic missiles, but it does raise the prospect of Canada deploying a satellite that could be linked to the US Space Tracking and Satellite System (STSS), once this space-based BMD sensor network is finally operational.[45] Such a system would provide sensor information to a range of possible BMD systems beyond GMD in North America. Canada's contribution to BMD would therefore not just be limited to

NORAD, which could open up new avenues of cooperation with the United States on military space.

Canada's interest in space-based assets is also not limited to Project Sapphire. For instance, the CAF currently uses data from the Radarsat-2 satellite under its Polar Epsilon project for Arctic surveillance, and it is currently planning to increase its Arctic and maritime surveillance capabilities with Polar Epsilon 2, which will gather data from a new constellation of satellites under the Radarsat Constellation Mission beginning in 2018.[46] In that respect, space-based assets not only offer a potential avenue into BMD, but may also provide a cost-effective way to provide all-domain awareness in the Arctic without the constructing multiple ground-based sensors in the harsh environment of Canada's North.

All three of these possible in-kind contributions could allow Canada to not only participate in BMD but to gain some level of assurance that it is protected. Still, such contributions will not be cheap. And any Canadian contribution to BMD may also entail opportunity costs, in which money spent on a Goose Bay radar site, for example, reduces available funds needed for recapitalization. After all, the CAF has a number of ongoing and future procurement projects and little in the way of discretionary funds. As such, an assessment on the benefits and costs of participating in BMD is required. It should also be done on the basis of Canada's national interests, rather on the more internationally-minded arguments that critics of BMD often employ – it is to these argument that this paper now turns.

MISSILE DEFENCE AND ITS CRITICS

Critics of BMD, while often particularly strident in their arguments, have not always been logically consistent. For instance, BMD has often been disparaged as being technologically infeasible and ineffective. On the other hand, however, missile defences have also been called a particularly destabilizing system capable of limiting the damage of any retaliatory Russian or Chinese nuclear strike, thereby threatening the situation of assured vulnerability that supposedly exists and underpins strategic nuclear stability with the United States. In such a scenario, BMD protecting the population of North America would increase crisis instability and spark a renewed arms race (arms race instability) between the US and both Russia and China.[47]

But what is not explicitly spelled out is how a supposedly ineffective system, which critics allege cannot even counter what would be a technologically primitive ballistic missile from a so-called rogue state like North Korea, could then realistically blunt Russia's large nuclear arsenal, given its large size and capacity to saturate and overwhelm even a thick, multilayered BMD system.[48] One can also add its proven capability to develop and/or deploy sophisticated countermeasures, decoys, and other advanced technologies, such as multiple-independently-targetable re-entry vehicles (MIRV), hypersonic speeds,

and maneuverable glider technology. A good example is Russia's plans to incorporate more advanced penetration aids on its ballistic missile force, which will better ensure their capability to overcome any BMD system.[49]

Of course, Russia has also been busy modernizing its nuclear force, with the addition of new heavy ballistic missiles (e.g., the *Sarmat* ICBM) and air-launched cruise missiles (ALCMs) for its *Bear-H* (TU-95 MS) and *Blackjack* (TU-160) bombers.[50] Much has also been made about a recent uptick in the number of Russian nuclear warheads. But one should also keep these developments in perspective.[51] New START's mandated limits of 1,550 strategic warheads will only come into effect by 2018, and despite the political posturing with warhead numbers, few expect Russia to seriously challenge this treaty limit. The reason for this is simple – the United States will have "downloaded" and stockpiled significantly more warheads than Russia under New START, which will give it a much greater capacity to breakout from the agreement's treaty-mandated numbers, if required.[52] Washington also retains a significant advantage in the number and quality of its nuclear delivery systems, which New START will do little to change given Moscow's inability to even reach the agreement's ceiling of 700 delivery systems.

As such, the challenges Russia faces with even simply retaining and modernizing its existing legacy nuclear arsenal, to say nothing about competing in a nuclear arms race against the United States, is often overlooked. So too is the underlying stability in US-Russian relations. True, there are certain areas that should be of concern. Among the most worrisome in Russia's possible encroachment against NATO's Baltic members, which could splinter the alliance, endanger its hallowed Article 5 clause on collective defence, and escalate into a nuclear crisis.[53] But, despite growing tensions arising from Ukraine and Syria, what is remarkable is the degree of crisis stability that currently exists between both countries, especially compared to the crisis prone days of the Cold War.

Indeed, the only conceivably scenario in which BMD could conceivably blunt a Russian nuclear strike is following a massive "disarming first-strike"[54] – and even that is debatable, given Russia's hardened silos, ability to disperse its nuclear forces to limit damage expectancy, and its posture to launch-on-warning (LOW) of attack.[55] Admittedly, Russia's reliance on LOW is rightly a concern from a crisis stability perspective, given the dangers of hair-trigger alerts, false warnings (owing to its degraded early warning system), and attendant "first-strike anxiety." But Russia maintained a LOW posture long before BMDs were deployed and will likely continue to do so given the general imbalance in strategic capabilities between both sides. Importantly, such a factor really only becomes salient in serious crises, which were common in the Cold War but have been held in abeyance since the start of the post-Cold War. Nuclear alerts may still happen, but their meaning has certainly changed when the two sides are not on the brink of war. To say that such a crisis-induced first-strike scenario taking place today is unrealistic, not to mention anachronistic, remains an understatement.[56]

China has a much smaller nuclear force capable of striking the continental US, currently estimated at 40 ICBMS. On one hand, unlike the Russians, this small force is conceivably more at risk of being blunted by an American BMD system, especially if one takes into account US conventional long-range strike capabilities that can be used for counterforce purposes (either to disarm or decapitate China's strategic nuclear forces, or for more conventional purposes to ensure operational access in contested anti-access and area denial environments). There are also certain scenarios that raise legitimate questions about coercion dynamics and crisis stability, such as the Taiwan Straits. On the other hand, there is also reason to believe that China is particularly ill-inclined to undertake the type of nuclear arms racing behaviour that critics seem to think will naturally arise from a BMD system. China has a long maintained a minimum deterrence posture for its nuclear arsenal, in which its central goal is to achieve "assured retaliation" against a country like the United States.[57]

Importantly, despite concerns about the US BMD system, China has not fundamentally departed from this doctrine. Rather than arms racing per se, China's efforts at nuclear modernization have been modest, gradual, and heavily qualitative in nature, such as the greater use of solid-fuelled rockets, road-mobile assets, and MIRVed missiles that can carry multiple warheads. Some quantitative increases have also taken place, including a doubling of its ICBM force.[58] Still, even following over a decade of strategic and theatre BMD deployments, China shows no sign of significantly expanding what remains a very small nuclear force – this fact seems unlikely to change in the near future.

Much still depends on whether the United States refrains from acting in a rash or precipitative manner to Chinese nuclear modernization efforts. It would also be beneficial to increase confidence and security-building measures with China. For instance, the US can communicate that its conventional long-range strike forces are not meant for counterforce targeting of China's nuclear forces, or that a LOW posture can facilitate instability in crisis situations, as a reminder for Beijing not to follow the Russian lead here. A good sign the US at least recognizes this requirement can be found in its *2010 Nuclear Posture Review* and *2010 Ballistic Missile Defence Review*, both of which noted the need to maintain strategic stability in Sino-American relations.[59]

Critics also tend to follow a technologically deterministic view of strategic stability, in which a system like BMD would automatically cause an "action-reaction" arms race and lead to crisis instability. Yet such capabilities must be situated within a broader politico-strategic milieu – one that provides the context to determine how a country views BMD and any moves to counter the system (e.g., increase in its nuclear arsenal).[60] It is this context that helps determine whether Russia or China view BMD as a prudent insurance against rogue states rather than an incipient move to achieve nuclear (and strategic) primacy by the United States, or – from the American perspective – whether Russian and Chinese moves to modernize

their arsenals and ensure a capacity to penetrate the BMD system are seen as a threat requiring a response or a benign and understandable effort to recalibrate and better achieve mutual vulnerability.

Despite some rising tension with Russia and China, relations with both countries remain far more robust and cooperative than even the least tense moment during the Cold War. One only needs to look at the multiple nuclear reduction agreements (SORT, New START) signed by the United States and Russia since the US withdrawal from the ABM Treaty, or the numerous elements of cooperation that temper the incipient rivalry between Washington and Beijing. The relatively stable relationship between the United States and Russia and China – which can and should be contrasted to the uncertain, high-threat, and crisis-prone relations with countries like North Korea and Iran – needs to be taken into account when assessing the impact of strategic missile defences on strategic stability.

It should also be considered when assessing Russian and Chinese justifications for their nuclear modernization efforts. Russia, in particular, has a tendency to blame American and European BMD capabilities in its nuclear and military modernization efforts. This is especially true today, when there is a more competitive dynamic at play owing to the growing political tensions over Crimea and Ukraine. Yet, rather than taking such claims at face value, one needs to ask whether elimination of BMD would realistically have any effect on Russian behaviour – or would another excuse be used to distract the West. More likely, Russia's efforts are driven by its need (operational and financial) to modernize and refurbish increasingly aging nuclear warheads and ballistic missiles, as well as by the fact that its domestic political legitimacy is increasingly heavily dependent on the perception that the Kremlin "defend[s] Russia from external enemies."[61]

The danger that BMD will magnify the proliferation risk in countries like Iran or North Korea is even more tenuous. The reason is simple: rogue states already face a massive conventional power imbalance with perceived adversaries like the United States. As scholars Charles Glaser and Steve Fetter have noted, nuclear weapons "are the only means of offsetting U.S. conventional superiority."[62] Such weapons are seen as "the great equalizer," capable of limiting America's freedom of action, influence its strategic calculations, and make coercion even more difficult.[63] For these reasons, BMD alone is unlikely to play much of a role in further enabling proliferation. Indeed, by reducing or eliminating the coercive and deterrent value of such weapons, it might have a dissuading effect on the acquisition of nuclear-armed ballistic missiles. As noted earlier, however, even if it does not, missile defences would play an integral role in damage limitation in the event of deterrence failure.

The last major criticism offered by critics relate to the technological feasibility of BMD interception. To be sure, it is difficult to deny that GBIs in North America were deployed before being fully tested, and therefore come with certain "reliability and other performance problems."[64] However, BMD interceptors

have shown a steady improvement in their testing record. The Missile Defence Agency reports that GBI has achieved 9 successes in 17 attempts since 1999, while the record for the two other systems have been even stronger – 33 out of 40 for Aegis BMD and a 13 out of 13 for THAAD (Terminal High Altitude Area Defence).[65] The record is not perfect, but there is reason to believe that progress is being made. For example, the US National Academy of Sciences pointed to the improvement in hit-to-kill interceptions against short-, medium-, and intermediate-range missiles, although it also noted that further work was needed against ICBMs.[66]

This helps to explain why so many countries – allies, partners, and others – are investing so much time, money, and resources in their *long-term* development. Missile defences rely on advanced technologies (hit-to-kill vehicles, advanced sensor systems) that are still being tested and developed. In other words, it is a work-in-progress that will continue to make important improvements on warhead tracking, target discrimination, and computer processing in the years ahead, which when combined with growing interceptor numbers (and consequently higher target kill probability) will steadily improve the system's effectiveness against what is still an emergent ICBM threat.

But what about the controversial nature of the testing parameters, which have led to accusations that tests have been fixed, or the ease by which countries could surely confused the system with decoys and countermeasures? On one hand, there is a logic to controlling testing parameters as a way to identify possible problems and ways to overcome such challenges. Doing so does not mean the Pentagon is fixing the tests.[67] On the other hand, claims that a country can easily overwhelm a BMD system, whether by sheer number of missiles or through countermeasures, overlooks how the targets of these systems – countries like Iran and North Korea – will be armed with "early generation missiles," likely to be limited in number and too technologically primitive for countermeasures.[68] Target discrimination will undoubtedly be among the most difficult task for any BMD system, but its requirement against rogue states is often overstated for this reason.

Equally important is the cost to develop and deploy effective countermeasures, which would create another development hurdle that rogue states will have to overcome. The offence-defence cost-effectiveness balance may still favour the former, since ballistic missiles, even with countermeasures and decoys, are still cheaper to develop than interceptors – a fact that should provide comfort to Russian and Chinese defence planners worried about BMD. But this needs to be placed in its proper context. The United States and other countries developing BMD are all wealthy and economically vibrant, in contrast to the main targets of BMD which are all poor and economically impoverished. As such, they have a much greater ability to fund BMD in absolute terms, meaning that the offence-defence cost-effectiveness balance is simply not as salient here.

CONCLUSION

The Defence Policy Review provides a good opportunity for Canada to finally revisit the previous Liberal government's 2005 decision to refuse participation on missile defence. NORAD may not be in existential crisis, but one of its key functions – aerospace warning – may not emerge unscathed indefinitely. Importantly, Canada is currently outside of the protection offered by the American GMD system and the risk of a (potentially nuclear-armed) ballistic missile attack, while admittedly unlikely, cannot be discounted altogether. Moreover, criticism of BMD have often been either overstated or hampered by a degree of logical inconsistency or dissonance. The often severe consequences of BMD deployments, especially vis-à-vis strategic defences for North America, have simply not been borne out by reality.

The only element of uncertainty about Canada participating in missile defence is the question of possible cost. It would be a mistake to assume that Canada could gain the benefits of BMD without sharing in some manner its costs. Today's situation is not akin to the Cold War, when Canadian territory was so important for continental air defence that the United States was willing to bear much of the cost of the air defence perimeter – from the CADIN-Pinetree Line to the Dew Line.[69] In the case of BMD, security is not necessarily indivisible, and prospects of Canadian free-riding on missile defence is unlikely to be accepted by Washington. This is especially true if Canada hopes to have any say in the interception process itself, and therefore gain some surety that its cities have a modicum of protection. To gain more than just a "seat at the console," to borrow a term used by Joel Sokolsky,[70] Canada will undoubtedly have to ante up.

Three possible in-kind contributions have been outlined in this paper, although additional ways for Canada to pay its way into BMD undoubtedly exist. None of the outlined contributions are particularly cheap. Much depends on the nature of the US missile defence architecture, its planned development, and envisioned use of technology. For example, the next administration could decide to deploy a third interceptor site in Europe rather than the East Coast, similar to what the Bush administration had originally envisioned. While offering some interesting trans-Atlantic cooperation opportunities, it would also have an impact on the value of any in-kind contributions that involve radar sites on Canadian territory.

The most significant "known unknown" is what the United States may require from Canada to secure both participation in missile defence and involvement in the interception process in North America. That cost needs to be weighed against other important defence spending requirements by Canadian decision-makers prior to making a definite commitment. Unfortunately, the only way for Canada to gain further information is to once again begin discussions with the United States on missile defence. In the past, Washington had wanted some definite indication of interest from Canada before giving additional details about BMD. Canadians have in turn long been cautious in making such a first move, given concerns that any such interest would be perceived as being tantamount to agreeing to participate without

knowledge of its cost.

Due to this uncertainty, the dance between both countries on BMD has often been halting and infrequent. Yet, irrespective of such fears, it seems time for Canada to begin "dancing anew" with its North American partner on missile defence – and to see where such a dance may ultimately lead.

ABOUT THE AUTHOR

Dr. David McDonough *is Research Manager and Senior Editor at the CDA Institute, and a research fellow at Dalhousie University's Centre for Foreign Policy Studies. He is a recipient of the SSHRC Canadian Graduate Scholarship (2006–9), the SDF Dr Ronald Baker Doctoral Scholarship (2009–10), Killam Doctoral Scholarships (2008–11), and a SSHRC Post-Doctoral Fellowship (2012–13). He received a PhD in Political Science from Dalhousie University in 2011. He has published widely on Canadian strategic policy and international security, including in* International Journal, Canadian Foreign Policy Journal, RUSI Journal, Journal of Military and Strategic Studies, Canadian Naval Review, Third World Quarterly, Comparative Strategy, Asian Security, *and* Calgary Paper in Military and Strategic Studies*, and is editor of (and contributor to)* Canada's National Security in the Post-9/11 World: Strategy, Interests, and Threats *(University of Toronto Press, 2012).*

NOTES

1. Canada, Department of National Defence, *Canadian Defence Review: Public Consultation* Document 2016, p. 13.

2. This point was raised to the author by Frank Harvey, Dalhousie University.

3. James Bezan, then Parliamentary Secretary to the Minister of National Defence, acknowledged the concern that Canadian officials were "sidelined" from missile intercept decisions under the current arrangement. This was followed by Prime Minister Stephen Harper himself, who emphasized the evolving global security environment and possible ballistic missile threats from countries like North Korea, and the need for the government to keep its options open. See Steven Chase, "Ottawa examines U.S. missile defence program," *Globe and Mail*, 12 May 2014, http://www.theglobeandmail.com/news/politics/ottawa-examines-merits-of-us-missile-defence-program/article18631579/; Steven Chase, "Harper won't rule out Canada joining U.S. missile defence program," *Globe and Mail*, 5 June 2014, http://www.theglobeandmail.com/news/politics/harper-wont-rule-out-canada-joining-us-missile-defence-program/article19001119/ and Jordan Press, "Harper leaves door open to join U.S. ballistic missile defence program," *Toronto Star*, 14 August 2015, http://www.thestar.com/news/federal-election/2015/08/14/harper-leaves-door-open-to-join-us-ballistic-missile-defence-program.html.

4. Daniel Lang and Romeo Dallaire, *Canada and Ballistic Missile Defence: Responding to the evolving threat* (Standing Senate Committee on National Security and Defence, June 2014).

5. The metaphor of a continental dance on BMD can be found

in James Fergusson, "'Shall We Dance? The Missile Defence Decision, NORAD Renewal and the Future of Canada-US Defence Relations" *Canadian Military Journal* 6, 2 (Summer 2005): pp. 13-22.

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7. Joseph Jockel, "Four US Military Commands: NORTHCOM NORAD, SPACECOM, STRATCOM – The Canadian Opportunity," I*RPP Working Paper* no 2003-02.

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9. Joseph Jockel, "Five lessons from the history of North American aerospace defence," *International Journal* 64, 3 (Autumn 2010): p. 1021.

10. Joseph Jockel and Joel Sokolsky, "Canada does not need saving," *International Journal* 70, 2 (2015): pp. 188-195.

11. Joseph Jockel, *Canada and NORAD 1957-2007: A History* (Kingston: Queens Centre for International Relations, Queens Defence Management Program, 2007), pp. 167-169; Philippe Lagassse, "Northern Command and the Evolution of Canada-US Defence Relations," *Canadian Military Journal* (Spring 2003), p. 19.

12. Andrea Charron, James Fergusson, and Nicolas Allarie, *'Left of Bang': NORAD's Maritime Warning Mission and North American Domain Awareness* (Centre for Defence and Security Studies, University of Manitoba, 8 October 2015), esp. Part 3.

13. Ibid., pp. 15, 43

14. James Fergusson, "The NORAD conundrum: Canada, missile defence, and military space," *International Journal* 70, 2 (2015), p. 209.

15. Thomas K. Hensley et al., "Understanding the Indications and Warning Efforts of U.S. Ballistic Missile Defense," *Joint Force Quarterly* 78, 3 (2015), http://www.isn.ethz.ch/Digital-Library/Articles/Detail/?id=192484.

16. Andrea Charron and James Fergusson, *NORAD in Perpetuity? Challenges and Opportunities for Canada* (Centre for Security and Defence Studies, University of Manitoba, 31 March 2014), p. 6. Also see James Fergusson, *Beneath the Radar: Change and Transformation in the Canada-US North American Defence Relationship* (Calgary, AB: Canadian Defence and Foreign Affairs Institute, December 2009).

17. Joseph Jockel, "Saving NORAD: Should Ottawa Seize the Obama Moment," *SPP Briefing Paper*, 2 (3 September 2009), p. 11.

18. Ibid.

19. Stephan Frühling, "Managing escalation: missile defence, strategy and US alliances," *International Affairs* 92, 1 (2016): p. 88; Oliver Thranert and Kerry Kartchner, "From Offense to Defense: Extended Deterrence and Missile Defence" in Stefanie von Hlatky and Andreas Wenger, eds., *The Future of Extended Deterrence: The United States, NATO, and Beyond* (Georgetown University Press, 2015), esp. pp. 161-164. The EPAA was primarily designed against the Iranian short-, medium-, and intermediate-range missile threat, although Phase 4 of the program using the SM-3 IIB interceptor was expected to have sufficient velocity to take down ICBMS. However, Phase 4 was cancelled in 2013 in favour of an increase in GBIs (14 additional intercept by 2017) for the continental GMD system.

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21. R. J. Sutherland, "Canada's Long Term Strategic Situation," *International Journal* 17, 3 (1962): p. 204.

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25. Brad Roberts, "On the Strategic Value of Ballistic Missile Defense," *Proliferation Paper* 50 (IFRI Security Studies Center, June 2014), http://www.ifri.org/sites/default/files/atoms/files/pp50roberts.pdf.

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35. Fergusson, *Canada and Ballistic Missile Defence*, p. 242.

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(Witner 2015/16): pp. 39-43; and Max Fisher, "How World War III became possible," *Vox*, 29 June 2015, http://www.vox.com/2015/6/29/8845913/russia-war.

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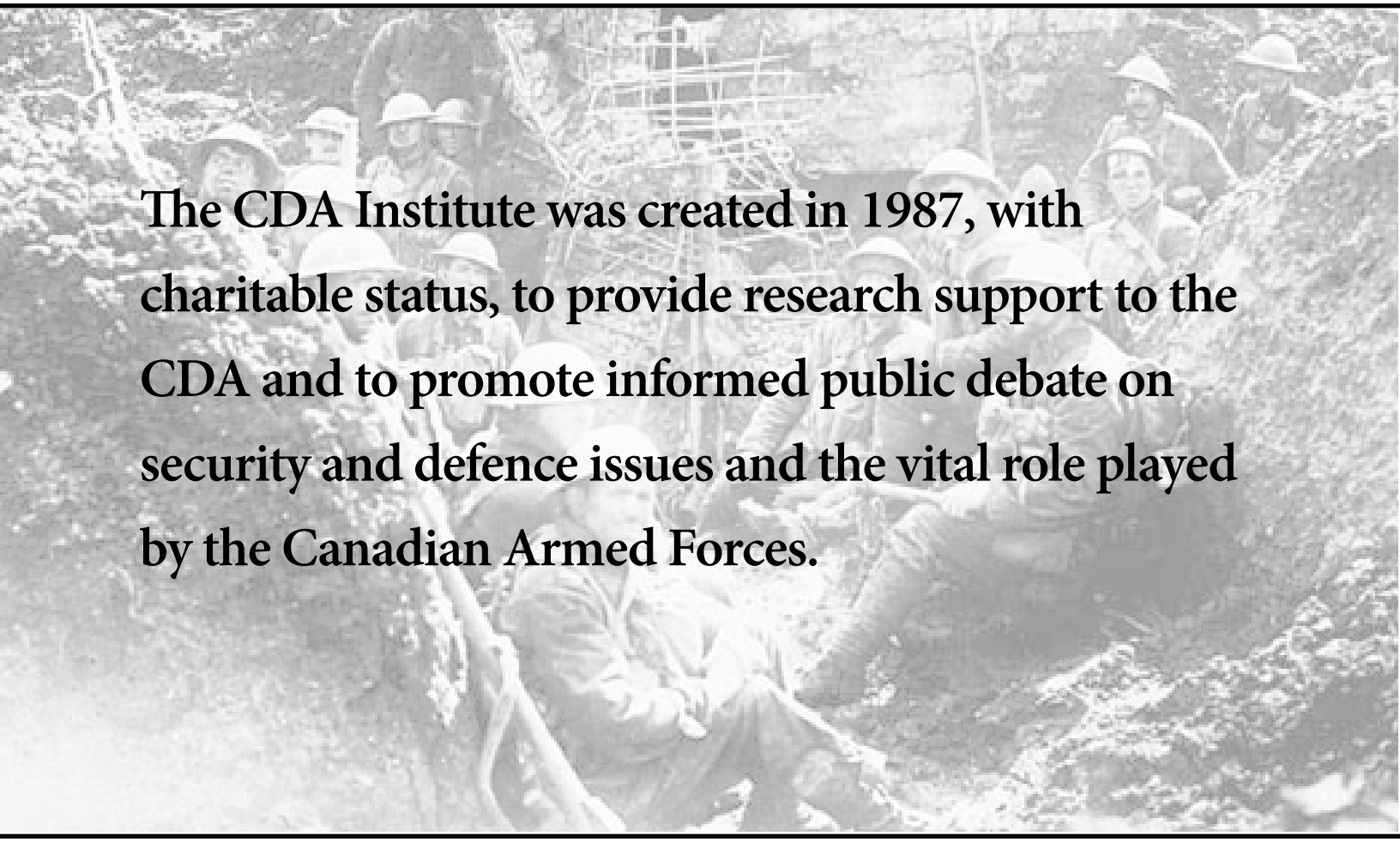

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L'INSTITUT DE LA CONFÉRENCE DES ASSOCIATIONS DE LA DÉFENSE

151 Slater Street, suite 412A , Ottawa, Ontario K1P 5H3
Phone / Téléphone: +1 (613) 236 9903

@CDAInstitute | www.cdainstitute.ca