CANADIAN NAVAL REVIEW

VOLUME 14, NUMBER 3 (2019)

Winner of the 2018 CNMT Essay Competition

The Case for Canadian Naval Ballistic Missile Defence

Mahan and Understanding the Future of Naval Competition in the Arctic Ocean

China's Arctic Policy and its Potential Impact on Canada's Arctic Security

Technology and Growth: The RCN During the Battle of the Atlantic

Our Sponsors and Supporters

Canadian Naval Review (*CNR*) is a 'not-for-profit' publication depending for funding upon its subscription base, the generosity of a small number of corporate sponsors, and support from the Department of National Defence. In addition, *CNR* is helped in meeting its objectives through the support of several professional and charitable organizations. Without that corporate support *CNR* would not be able to maintain its content diversity and its high quality. Corporate and institutional support also makes it possible to put copies of *CNR* in the hands of Canadian political decision-makers. The help of all our supporters allows *CNR* to continue the extensive outreach program established to further public awareness of naval and maritime security and oceans issues in Canada.

NAVAL ASSOCIATION OF CANADA
ASSOCIATION NAVALE DU CANADA

(www.navalassoc.ca)

CANADA'S NAVAL MEMORIAL H.M.C.S. SACKVILLE MÉMORIAL NAVAL CANADIEN

(www.canadasnavalmemorial.ca)

NAVY LEAGUE 1895 LIGUE NAVALE

(www.navyleague.ca)

LOCKHEED MARTIN

MDA A MAXAR COMPANY

seaspan

L3 Technologies

ROYAL CANADIAN NAVY MARINE ROYALE CANADIENNE

Bluedrop TRAINING & SIMULATION

FEDERAL

To receive more information about the corporate sponsorship plan or to find out more about supporting *CNR* in other ways, such as through subscription donations and bulk institutional subscriptions, please contact us at naval.review@dal.ca.

CANADIAN NAVAL REVIEW

VOLUME 14, NO. 3 (2019)

The editorial offices of *CNR* are located at the Brian Mulroney Institute of Government, St. Francis Xavier University in Antigonish, Nova Scotia. The mailing address is: Canadian Naval Review, C/O Adam Lajeunesse, Lane Hall, St. Francis Xavier University, 2330 Notre Dame Ave., Antigonish, Nova Scotia, Canada, B2G 2W5

Email: naval.review@dal.ca
Website: www.navalreview.ca
Twitter: @CdnNavalReview

Canadian Naval Review is published by the Brian Mulroney Institute of Government at St. Francis Xavier University. It is a professional journal examining a wide range of maritime security issues from a Canadian perspective. In particular it focuses on strategic concepts, policies, operations, history and procurement of the Canadian Navy, plus national security in general and marine/ocean affairs. This initiative brings together members of the Canadian defence and academic communities.

Canadian Naval Review has three primary objectives:

- provide a public forum for the discussion of the maritime dimension of Canada's national security;
- provide a public forum for the discussion of Canada's naval and maritime policies; and
- provide a source for the public examination of Canadian naval and maritime history and for the development of lessons learned.

The material included in *CNR* is presented for the professional and general education of the readers. Articles, commentaries and opinion pieces are invited from the widest possible spectrum for the purpose of informing, stimulating debate and generally challenging readers. The opinions expressed by the authors do not necessarily reflect the opinions of the Editor, Editorial Board, Brian Mulroney Institute, the Department of National Defence, or the Canadian Navy.

Articles, opinion pieces, book reviews and letters may be submitted via email or mailed (with an electronic copy) to the address given above. Send to the attention of the Editor, Dr. Ann Griffiths. Articles are to be in Word or WordPerfect format and no longer than 3,000 words. Articles must not have been published elsewhere. Citations should be kept to a minimum and articles must be accompanied by a 100-120 word abstract. Opinion pieces are to be 1,000-1,500 words. Book reviews are to be 500-750 words. Photos may be submitted with articles or commentaries but they must be at least 300 dpi, at an equivalent size to 5 by 7 inches, and internet images cannot be used. Intellectual copyright will remain the property of the author, however, the right to re-publish articles initially published in *Canadian Naval Review* remains with the Editorial Board. Articles and commentaries written in French are welcome and, if accepted, will be published in French.

Credit: Cpl Donna McDonald

*The **Kingston**-class Maritime Coastal Defence Vessel HMCS **Saskatoon** sails near a large piece of ice ('bergy bit') during **Operation Nanook 2015** in the Admundsen Gulf, 22 August 2015.*

Contents

Editorial

Trends and Themes in Maritime and Arctic Security and Safety

Maritime and Arctic Security and Safety (MASS) Conference 2018, now in its sixth year, was held 15-16 November 2018 (with some site visits on the 14th) in St. John's, Newfoundland. Despite the weather (which hit on the way in and out), the welcome was very warm and included a 'screech in.' MASS 2018 brought together maritime industry representatives, federal and some provincial representation and a few academics to explore maritime and Arctic security and safety with a particular focus on Arctic technology.

The impetus for the conference is to showcase Atlantic Canada's considerable maritime business and technology talents. As a result, industry networking and opportunities to show off products and services of various companies, especially Canadian ones, are the main conference deliverables. For an academic, this is an important introduction to what is the driving factor behind many government decisions related to the oceans and the Arctic: can the service/product/solution be provided by industry (preferably Canadian) as government is limited in terms of resources, personnel and capacity? In addition to the displays and exhibits, attendees could socialize during the conference breaks, and there was the opportunity to book one-on-one meetings with industry and government representatives – an excellent and innovative idea. I took advantage of the opportunity to meet with the Canadian Coast Guard (CCG), Global Affairs Canada (Trade Commissioner Services) and Public Services and Procurement Canada with the goal of understanding their challenges in the Arctic and seeking new opportunities for my students at the University of Manitoba. Many other participants were keen for appointments with large companies (including Thales and Lockheed Martin to name just two) and smaller ones (Avalon Holographics, GRI Simulations, Rosborough Boats). Government and business representatives knew each other well and knew the products. I was definitely the one in need of the most education.

Offshore support ships line the waterfront of St. John's, Newfoundland, on 2 July 2011. The city's enduring maritime nature makes a perfect venue for the annual Maritime and Arctic Security and Safety conference, despite the occasional uncooperative weather.

The Arctic technology theme of MASS 2018 naturally dominated the presentations. From the new, private communication satellites, which allow vessels north of 79N to access the internet, to new advanced composite hull crafts ('go-fast boats') used by the RCMP, Department of Fisheries and Oceans and other departments, to training scenario simulators (to allow the navy or CCG to test lifeboat modelling), to the wave and wind facilities of Memorial University in Newfoundland (MUN) and the National Research Council, it was an impressive overview of products and solutions provided by mainly Canadian companies. Academics can learn a lot from the succinct presentations by industry and government representatives often with impressive graphics and (of course!) Game of Thrones-inspired music to go with their videos.

Beyond the very professional presentations, what was fascinating for me was often what was not mentioned explicitly. Indeed four 'non' or implicit themes emerged: climate change; indigenous peoples; processing and analysing; and geopolitics.

First, it was often government departments that raised the issue of climate change and the need to prepare. The implicit assumption of all in attendance was that climate change was both an opportunity to exploit, often via new and incredible simulators, satellites, software and vehicles, and a challenge to mitigate, the latter becoming an exclusive policy area of government departments. Much of the Canadian Ice Services' (excellent) presentation, for example, underlined the complexity of climate change in the Arctic. The presentation noted, for example, the fact that the amount of ice is *increasing* in many northern areas and that climate change is making navigation more difficult because of ice buildup, not less so.

The second issue rarely mentioned – except as referenced by government agencies – was how indigenous and local Arctic populations might be a part of or benefit from the technology. In other words, the people element of the

Arctic was a bit lost in the focus on technology. This is by no means unique to this conference – it is a perennial concern – but might be a topic for next year's conference to change the focus and bring back the essential human element into the presentations.

While there was an emphasis on providing more information and data via sensors, satellites and modelling, there was little mention of how the increased amount and scope of information would be processed. Canadian Ice Services, for example, uses ice models and maps to provide clients with information in visual forms, but this requires analysts to provide context to the information and, importantly, clients need to be able to access the information in a timely basis (presumably by internet) which is a considerable challenge in the Arctic. Similarly, there are great expectations for the launch of Radarsat Constellation, now scheduled for February 2019, to provide greater and better quality domain awareness to all of the various stakeholders. However, the right information has to get to the right clients with the tools and skills to make sense of the resulting operating picture. I suspect the Marine Security Operations Centres (MSOCs) – whole-of-government intelligence fusion centres located on the West Coast, Great Lakes and East Coast – will benefit from the information. The East Coast MSOC provides Canada's Arctic Maritime Operating Picture which is then sent to allies, including to USFLEET FORCES for delivery to NORAD. The filters, analysis and inputs all along the domain 'food chain,' however, need to be managed and reviewed regularly.

Finally, the topic that is often the first to be discussed when it comes to the Arctic – geopolitics – was not raised until the end of this conference. To be sure, much of the technology presented could be applied to address the growing concern both Canada and the United States have for the intentions of near-peer competitors in the Arctic and the perhaps inevitable increase in vessel traffic in Canada's Arctic. But true to form, scientists, businesses and uniformed public servants are able to hover above political machinations, focused more on solutions than problems. Conversely, academics tend to ruminate on the problems and challenges. The cybersecurity dimension of all of the technology in the Arctic is a case in point. Certainly, when all three groups work together to consider the potential opportunities and challenges, the understanding of issues is improved and definitely enhanced with local input.

Credit: Leading Seaman Dan Bard, Formation Imaging Services.

A view of the Halifax Marine Security Operations Centre operation floor, 2015. The inter-agency MSOCs, a key part of the North American maritime intelligence chain, could benefit from the many technical sources of maritime awareness discussed at the MASS conference.

Credit: Women in Defence and Security Canada

Queen's University PhD Candidates Meaghan Shoemaker and Lindsay Coombs (centre) were awarded the Women in Defence and Security (WiDS) Annual Memorial Scholarship and Canadian Global Affairs Institute (CGAI) Fellowship, respectively, on 8 March 2018. Organizations like WiDS could be partners for future MASS conferences.

Increased diversity of both presenters and participants is a goal of the organizers of MASS. Especially given Labrador's Arctic credentials, the organizers are hoping to have indigenous groups and companies present in the future. In addition, the organizers hope to have more female participants. Memorial University boasts the highest number of female engineering students in the country (27%),[1] and among the students who attended from MUN, many were aided by the university's Entrepreneur Centre and mandatory co-op program for engineers. This means that they are used to interacting with business colleagues – something with which I fear many academics, including myself, have far less experience. Opportunities to attend these conferences are essential and MASS' commitment to student participation is to be encouraged. MASS may also want to consider partnering with groups like Women in Defence and Security (WiDS) and/or Women in International Security (WIIS) Canada in the future. These two organizations promote and support the advancement of women in careers related to Canadian defence and security industries. The newest Commander of the Arctic Offshore Patrol Vessel HMCS *Margaret Brooke*, Commander Michele Tessier, is a natural example. New and different voices will only enhance the quality of discussions and will generate more questions from the audience.

Dr. Andrea Charron, University of Manitoba

Notes

1. Jackey Locke, "Closing the Gap: Memorial Engineering Leads in National Female Undergraduate Enrolment," Memorial University, 6 June 2018.

Winner of the 2018 CNMT Essay Competition

The Case for Canadian Naval Ballistic Missile Defence

Adam P. MacDonald

The cornerstone of the National Shipbuilding Strategy (NSS) – the multi-billion-dollar program to recapitalize major aspects of Canada's navy and coast guard – is the development of the Canadian Surface Combatant (CSC). The CSC will become the principal surface warship of the Royal Canadian Navy (RCN), which as outlined in the navy's strategic planning document (*Leadmark 2050*) must be comprised of multi-role, multi-purpose and globally deployable assets able to operate in high-end combat environments.[1] In determining the suite of capabilities and capacities to achieve such requirements, serious consideration should be given to including ballistic missile defence (BMD) functions or acquiring a platform which could easily be modified to incorporate these in the future.

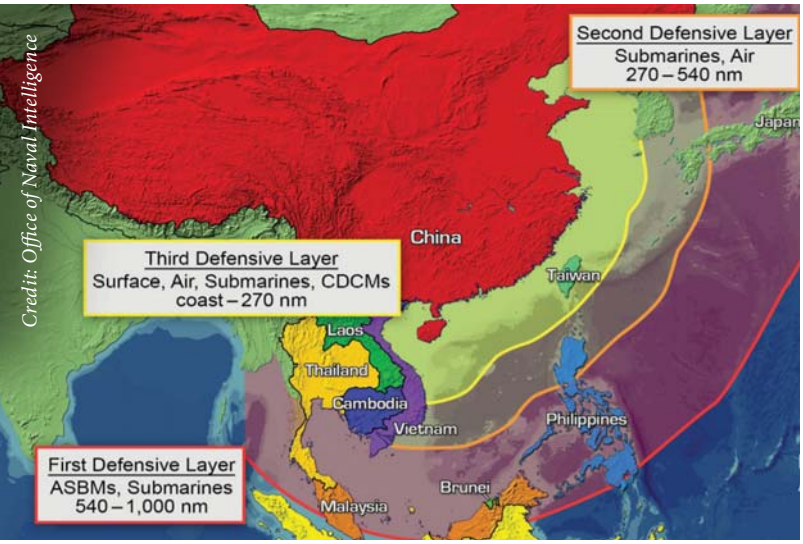
Naval BMD would serve three interconnected defence interests: accessibility; adaptability; and alliance maintenance. Accessibility refers to preserving the ability and confidence of the RCN to sail and operate in areas of the world which are increasingly contested militarily and defined by the proliferation of ballistic and cruise missiles meant to intimidate access to and manoeuvring within these areas, specifically at sea. Naval BMD, furthermore, would contribute to the adaptability of the CSC to conduct multi-role missions and operate within increasingly complex, multi-threat environments. Finally, naval BMD would strengthen interoperability with allies procuring such systems, and could offer a portal of entry into the US North American BMD system.

The Emerging Military Environment

Western military primacy, specifically sea and air superiority, is eroding as a number of states augment their military power in large part to target Western regional bases and forces. This changing military balance has not yet resulted in the expulsion of Western, specifically American, forces from these regions, the erosion of alliance partnerships, or the assumption of complete sea and air dominance by another power. The era, however, of Western military primacy defined by in-theatre assets and forces coming into and operating in these spaces without concern about being vulnerable to the forces of other states is coming to an end.

In particular, several adversarial and peer-competitor states are employing a myriad of weapons and strategies to target American and allied forces at greater distances

*The **Arleigh Burke**-class guided-missile destroyer USS **Hopper** (DDG 70) fires a Standard Missile-3 (SM-3) Block IB Threat Upgrade guided missile on 25 May 2016, off the coast of Hawaii. SM-3 missiles are designed to destroy short-to-intermediate-range ballistic missiles prior to their re-entry into the atmosphere.*



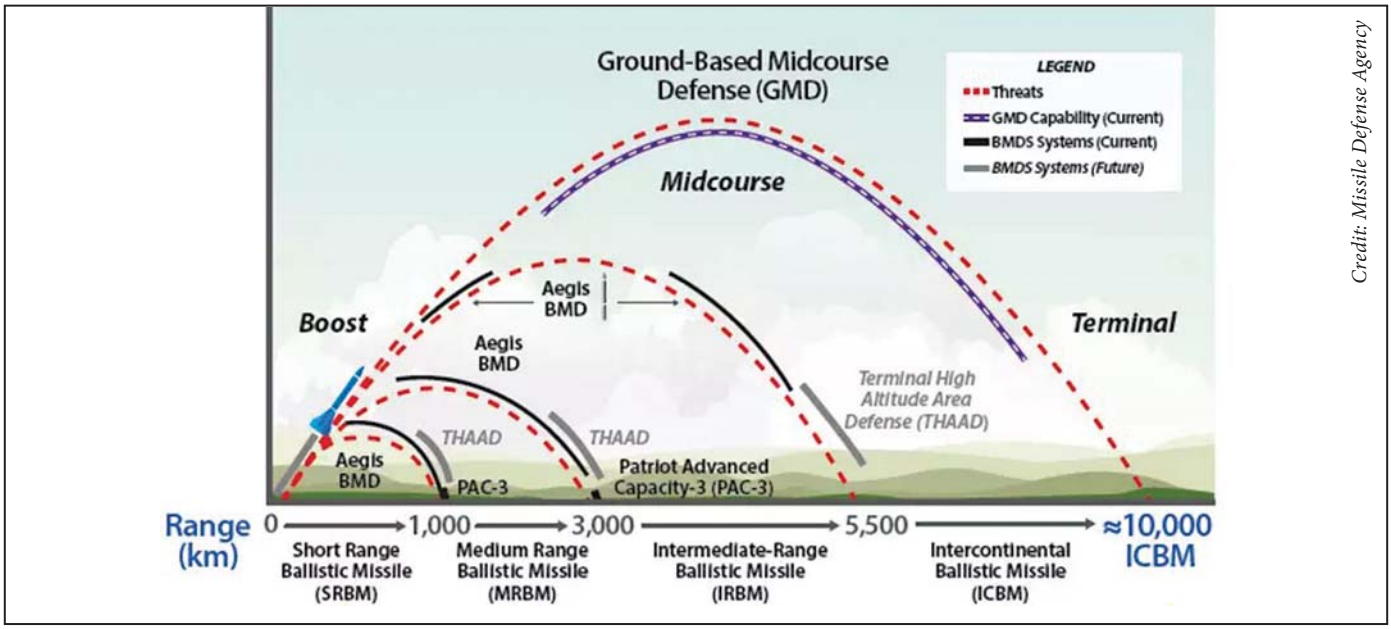
Credit: Office of Naval Intelligence

China's DF-21D anti-ship ballistic missiles form the outer layer of its military defence.

to induce caution in their deployments and operations. These tactics, known as anti-access/area denial (A2/AD), are meant to challenge access to and manoeuvrability within a region by holding opposing forces at risk of attack at increasingly further distances, denying them sea and air supremacy but not necessarily establishing control over these spaces. One of the most important weapons of such an arsenal is missiles, both cruise and increasingly ballistic variants. In the last two decades there has been a horizontal (number of states possessing them) and vertical (size and diversity of arsenal held by each state) proliferation of ballistic missiles, specifically in East Asia and the Middle East between antagonistic dyads of states competing over disputed territorial claims, historical grievances and/or spheres of influence. Examples include Iran-Saudi Arabia, Pakistan-India, North Korea-South Korea, China-Taiwan and China-Japan. Given that many of these pairs include American allies or close defence partners, limiting US power projection and eroding American willingness to defend these states is a key objective for competitor/adversarial states. Cruise and ballistic missiles are also desirable weapons because they are relatively cheap, have the potential to penetrate defensive systems and are symbols of national power.[2]

Iran around the Straits of Hormuz, Russia in Eastern Europe and North Korea in Northeast Asia are areas of Western concern with respect to A2/AD. By far, however, the most important in terms of comprehensively jeopardizing Western power is East Asia due to the increasing military power of China. China is quickly becoming the new centre of global economic power in East Asia but the region is also home to several ongoing and outstanding territorial disputes and historical grievances, many involving China directly. Beijing is attempting to gain greater control over the trajectory of East Asia by using a mixture of economic, political and military instruments of power to shape the region to its benefit. One of the key aspects of China's approach is using military power to break US dominance and invulnerability throughout the Three Island Chains surrounding China with an ever-expanding arsenal of missiles (including deploying the world's first anti-ship ballistic missile) from the Chinese mainland, an expanding naval fleet and several new bases in the South China Sea.[3] China's military is being prepared to fight in combat if needed, but Beijing prefers a gradual and non-violent change to the region's balance of power shifting to its advantage thereby diminishing American power and resolve to uphold existing security commitments.

Where does Canada fit into this picture? Canada is active throughout East Asia on several fronts, including a growth in defence and security relations and activities



Credit: Missile Defense Agency

Each ballistic missile defence technology is tailored towards specific target types and stage of ascent/descent.

which have historically been absent from previous trade-centric approaches to the region. Current and future deployment cycles of the RCN signal a growing interest in the region militarily, including a near continuous naval presence scheduled there for the next few years.[4] The RCN`s approach in Asia is largely defined by maritime diplomacy, visiting and operating with a number of regional militaries, including China's, to build Canada's status in the region as a committed security partner.[5] In view of its desire to build relations, the government has largely been silent on several outstanding maritime and territorial disputes and non-committal about its specific views towards and policies pertaining to freedom of navigation (FON) patrols.

China`s increasing presence and capabilities in these waters, however, is a military development to which the RCN must adjust in planning deployments and operations there. The plan to develop good relations has been tinged with concern about Chinese actions, including being shadowed by Chinese forces.[6] Being familiar with such tactics by Russia in the Black and Mediterranean Seas, Canada has experience in and thus is well-suited to prepare for and act accordingly. It should be noted that there are as yet no explicit indications that China will become increasingly aggressive in attempting to evict foreign naval forces from its claimed waters.

With RCN ships expected increasingly to sail through such disputed waters – the vastness of the area which is disputed makes it difficult to avoid – and increasing FON patrols by the United States and others including Japan and some European states, whether Canada can remain completely ambiguous on this matter is questionable.[7] Nevertheless, the RCN should be equipped with the capabilities required to operate confidently in disputed spaces, operate with allies and partners, and further the Canadian maritime diplomatic approach of being a trusted and present security partner in the region. Such an approach is not an attempt to re-assert American primacy or contain China[8] but rather to ensure global maritime spaces in all regions, including those closer to home such as in the Arctic, remain free and open to naval and commercial vessels. As well, it would support local allies and partners facing conventional and nuclear ballistic missile threats.

Embrace of Naval BMD by Allies

Over the last decade European states and close defence partners in Asia have begun to incorporate a BMD capability into their navies, in most cases working with the United States which has the largest and most advanced naval BMD system in the world: AEGIS BMD, which was developed in the 1980s to defend naval forces against aircraft and cruise missile threats. In the early 2000s the US Navy (USN) began equipping its warships with the ability to track and shoot down enemy ballistic missiles by expanding the AEGIS Combat System with the addition of new radars and interceptor missiles to engage ballistic missiles during their mid-course phase of flight outside the atmosphere. Currently the USN has 38 AEGIS BMD-capable ships with plans to increase this force by 50% by 2023.[9] As well, the United States is developing AEGIS Ashore sites in several allied states with the same capabilities as its naval version but in a fixed, on land site.

In 2010 NATO agreed to develop a BMD system to protect its European member states and this has resulted in a number of system deployments throughout the continent. These include: AEGIS Ashore stations in Romania and Poland; permanently stationed AEGIS BMD ships in Spain; a continental BMD command quarters in Germany; and national BMD projects pursued by several NATO states

Credit: Kees Torn, Flickr

*Dutch frigate HNLMS **Tromp**, pictured here near Rotterdam 4 September 2017, used its SMART-L radar (the large, black rotating array on the aft superstructure) to track a ballistic missile target in 2006. **Tromp** and the rest of the **De Zeven Provincien**-class frigates are having their SMART-L radars upgraded to support BMD capabilities.*

Credit: US Army

The AEGIS Ashore Missile Defense Test Complex on Kauai, Hawaii, successfully fired a SM-3 Block IIA missile to intercept an intermediate-range ballistic missile target on 10 December 2018. Additional AEGIS Ashore complexes are or will be located in Poland, Romania and Japan.

such as an indigenous BMD-ashore system in the UK and tracking (but not intercepting) ballistic missiles capabilities in the Danish and Dutch navies. Taken together these form a patchwork, interim BMD system that NATO is committed to continue to develop and fully integrate. In Asia, Japan is working extensively with the United States in research and development and the deployment of AEGIS BMD systems. This includes the ongoing conversion of its *Kongo*-class AEGIS ships to be BMD capable and the announcement of plans to build two AEGIS Ashore systems.[10] Australia, where there is currently ongoing debate about whether the country requires BMD, has thus far opted out of joining or building such a system but its newest air warfare destroyer, the *Hobart*-class, will include the AEGIS Combat System which will facilitate easy upgrading to do so in the future if decided by Canberra.[11]

Naval BMD participation, therefore, offers an ideal avenue for Canada to enhance alliance relations by ensuring interoperability in this emerging capability. It would also strongly signal support for allies' defence priorities (Ottawa is a signatory of NATO's 2010 Strategic Concept identifying BMD as a key focus), and provide naval assets which can perform a number of functions in support of allied operations including protecting naval task forces against attack or contributing to their territorial security. Any decision by Canada to acquire AEGIS BMD, which was recommended in a recent Senate Report,[12] for its navy would allow seamless integration into such missions, including relieving over-extended USN BMD patrols around allied states like Japan.[13] While not capable of intercepting intercontinental ballistic missiles, the ability to relay tracking information by AEGIS BMD to other systems would also provide Canada a possible entry point into the American Ground-Based Midcourse Defence (GMD) system.

Alternative to Ground-Based Midcourse Defence

Historically, discussion of Canadian BMD participation has been with respect to the US Ground-based Midcourse Defence (GMD) system, deployed in 2004, comprised of a series of radars and interceptor missiles based in Alaska and California. This system is designed to provide coverage to the continental United States against a small-scale, rudimentary intercontinental ballistic missile attack from a rogue state like North Korea. In 2005 then Prime Minister Paul Martin, after months of divisive public debate, decided Canada would not join GMD. Amidst the increasing nuclear and missile capabilities of and vitriolic threats made by North Korea against the United States in 2017, a steady stream of security experts and former government officials (including some involved in the original decision) and retired military officers have advocated for Canada's immediate participation in GMD.[14] Despite such advocacy, and Ottawa's acknowledgement of the growing number of actors able to target Canada and its overseas deployed units with ballistic missiles, the current government has decided to maintain the policy of non-participation.[15] Maintaining the status quo with respect to GMD

A ground-based interceptor is launched from Vandenberg Air Force Base, California, which intercepted a ballistic missile target launched from the US Army's test site on Kwajalein Atoll. Vandenberg and Fort Greely, Alaska, are the two bases for the Ground-based Midcourse Defense system, designed to defend the United States against intercontinental ballistic missiles. Canada has been invited to participate in the GMD program, but remains uncommitted.

is a justifiable position given that many of the doomsday scenarios voiced in the early 2000s have not come to fruition, for example destabilizing nuclear rivalry with Russia and China, nuclear blackmail by rogue regimes, the militarization of space, or the collapse of NORAD. The reduction, furthermore, of GMD participation to North Korean threat assessments has neglected other important considerations including costs, expected contributions and the purpose of the system in American grand strategy.

Even with the determination that Canada does not face an immediate and grave threat necessitating GMD participation, however, the blanket ban on participation in BMD is ill-advised. While it may remain politically unpalatable to join GMD – especially given public concerns about the foreign policy of President Donald Trump which parallels similar unease and unpopularity of the George W. Bush administration which publicly lobbied for Ottawa's participation – naval BMD would allow a portal into GMD as the two systems become increasingly linked in terms of information relaying and creating a common operating picture.[16] BMD is a reality and an American priority which affects Canada, thus Ottawa should be interested in maintaining access to American thinking, strategies and policies with respect to continental BMD. Naval BMD would not lead to Canada having a 'seat at the table' in terms of decision-making authority, but it could enable Ottawa to have an ear in the conversation, specifically to maintain situational awareness on American GMD developments such as interceptor strategies which could have an impact on Canada and thus influence any future decision to participate or build its own system.

Concerns that the various American BMD-deployed systems, and their interlinkages, across the globe will jeopardize strategic relations with Russia and China may also caution against any Canadian BMD participation. This concern would be a mistake, however, as China, Russia and others are developing their own ballistic missile and BMD forces, thus contributing to the growing missile versus BMD nexus of which Canada needs to be aware. Canada could take prudent measures to ensure naval BMD assets are selectively deployed to avoid any unnecessary antagonism and tension. For example, a subset of the CSC class could be BMD capable and thus moved into areas during crises, but not deployed in other areas where A2/AD threats are minimal/non-existent such as the Arctic region. Naval BMD, therefore, allows for involvement in this military area with the United States and allies without re-hashing divisive public debates about GMD participation directly.

Available Options

There were three bids competing for the CSC contract.[17] It is highly doubtful, given Canada's continuing stance about non-participation, that a BMD component has been included in the government's requirements for the CSC. Including the possibility to incorporate such a capability in the future, however, should be a consideration, and all three bids provide avenues to do so. The Type 26 developed for the UK, which ultimately was chosen as the winning design in Canada, has a Vertical Launch System that can accommodate BMD interceptors. The Dutch have incorporated a ballistic missile tracking and information relaying capacity to allied AEGIS assets in their *De Zeven Provinciën*-class warships and are investigating plans

Credit: US Navy

*The **Ticonderoga**-class guided-missile cruiser USS **Shiloh** (CG 67) launches a SM-3 missile in the Pacific Ocean on 22 June 2006, successfully intercepting a target in this seventh of eight Aegis BMD flight tests. Multiple iterations of the SM-3 missile since these early years have brought improved target discrimination capabilities and accuracy.*

possibly to arm them with interceptor missiles. Finally, the Spanish F-105 frigate option is serving as the model for the Australian *Hobart*-class air warfare destroyers, which while not being equipped with BMD will have the AEGIS Combat System allowing for easy upgrading. The CSC will be the predominant surface warfare platform of the RCN well into the latter half of this century – a century which undoubtedly will be defined by increasing uncertainty in the global military and strategic landscape – and thus the ship design must include a command management system that is flexible and adaptable to integrating new capacities such as BMD to operate in more complex and contentious areas.

Canada is the only country of the major and middle powers without its own or part of a multilateral BMD system. To be clear, Canada/the RCN does not face an imminent risk from ballistic missiles (defined as a state possessing both the capability and intent to use them). However, as competitors and possible adversaries continue to develop these assets, and allies build systems to defend against them, a new nexus in military competition – missiles versus missile defence systems – is emerging as a major feature of an increasingly complicated and contested global environment. Canada should remain apprised of these developments and adapt to them as necessary.[18] Naval BMD provides pragmatic, operational benefit to the RCN in operating in theatres of growing contestation while also offering a portal of entry into the wider global BMD developments.

Notes

1. Department of National Defence, *Leadmark 2050: Canada in a New Maritime World*, 21 June 2016, pp. v-vi.
2. "Ballistic and Cruise Missile Threats," The National Air and Space Intelligence Centre, 2017.
3. US Department of Defense, "Military and Security Developments Involving the People's Republic of China 2018," specifically "Chapter 3: Force Modernization Goals and Trends."
4. David Pugliese, "Canadian Navy Plans Persistent Presence in the Asia-Pacific," *Seapower*, April 2018, pp. 28-29.
5. Canadian military assets are doing other operations in East Asia as well, such as air and naval surveillance to monitor sanction violations at sea with respect to North Korea. In general, however, unlike the RCN's ongoing contribution to NATO task forces which is in large measure an overt balancing mission against Russia, in East Asia Canadian naval ships are not part of an explicit coalition of allies operating to balance China or any other state.
6. Mathew Fisher, "Canadian Warships Shadowed by Chinese Navy in South China Sea," *The National Post*, 14 July 2017.
7. Adam P. MacDonald, "Why Canada Needs to Lay the Ground Work for Freedom of Navigation Patrols in East Asia," Macdonald-Laurier Institute, 29 August 2017.
8. An example of such a strategy would be providing A2/AD weaponry to Asian states to counteract China's growing regional military power. See Timothy Bonds, et al., "What Role can Land-Based, Multi-Domain Anti-Access/Area Denial Forces Play in Deterring or Defeating Aggression?" The RAND Corporation, 2017.
9. "US Navy Looks to Grow BMD Ship Force," *Jane's Navy International*, 3 May 2018.
10. North Atlantic Treaty Organization (NATO), "NATO Ballistic Missile Defence Fact Sheet," NATO, July 2016; Congressional Research Service, "Navy Aegis Ballistic Missile Defense (BMD) Program: Background and Issues for Congress," 5 July 2018, pp. 8-9.
11. John Baxland, "Ballistic Missile Defence: New Options for Australia," *The Interpreter*, 4 October 2017.
12. The report recommends that the RCN acquire the AEGIS Combat System, not specifically AEGIS BMD, but lists BMD functions as one of its capabilities. See Standing Senate Committee on National Security and Defence, *Reinvesting in the Canadian Armed Forces: A Plan for the Future*, Report of the Standing Senate Committee on National Security and Defence, May 2017.
13. "The US Navy is Fed Up With Ballistic Missile Defense Patrols," *Defense News*, 16 June 2018.
14. Jeffrey F. Collins, "Should Canada Participate in Ballistic Missile Defence: A Survey of the Experts," The Macdonald-Laurier Institute, July 2018.
15. Department of National Defence, *Strong, Secure, Engaged: Canada's Defence Policy*, 7 July 2017, p. 54.
16. "Aegis Ballistic Missile Defense," Missile Defense Agency, 2018, available at www.mda.mil/system/aegis_bmd.html.
17. David Pugliese, "It's Make or Break Time for Canadian Surface Combatant Bidders," *Ottawa Citizen*, 15 June 2018.
18. Dan Goure, "The Next Great Arms Race is Here: Missiles vs. Missile Defense," *The National Interest*, 8 September 2016.

Adam P. MacDonald is a PhD student in the Political Science at Dalhousie University and the Deputy Director of the Centre for the Study of Security and Development.

Mahan and Understanding the Future of Naval Competition in the Arctic Ocean

Rob Huebert

Credit: Lars Bøgh Vinther, Danish Defence (Forsvaret)

*Tugboat **Svitzer Thor** assists the Chinese Type 054A guided-missile frigate **Yiyang** while docking in Copenhagen in 2015 as part of a three-ship task group.*

Many have contended that the Arctic is an exceptional zone of peace that remains beyond the normal challenges of the international system.[1] Arctic exceptionalism is often used to explain the geopolitical rivalries that may occur elsewhere but are absent from the region.[2] However, there is growing evidence that even if this had ever been true, it will soon change. Ultimately the Arctic is about to become one of the most important geopolitical regions of the world.

When talking today about the growing geopolitical importance of the Arctic, most people focus on the actions of the Russian government which many characterize as the re-militarization of the region.[3] This may be partially accurate, but it does not tell the full story nor does it provide a full long-term understanding of the topic. Rather there are early indications that the Chinese government is now taking decisions to develop the military capabilities to be a major strategic actor in the Arctic. China has also been quite active in the Antarctic, and in fact developed much of initial polar knowledge there, but this article will only discuss Chinese actions in the Arctic.

Very recently Chinese deployments have taken place in both the western and eastern sides of the outer limits of the Arctic Ocean. Commencing in 2015, these deployments have included port visits to Nordic countries as well as to Russia. China has also sent a task force into the Bering Sea.[4] These voyages are very preliminary and are relatively insignificant by themselves. So why should these seemingly isolated events suggest that China is about to become an Arctic maritime power or attempt to become a 'white-water navy'?

The answer lies in an application of the works of Alfred Thayer Mahan – a nineteenth century US Navy officer and naval strategist – to the current efforts of China to become a peer competitor to the United States as well as Russia. An understanding of Mahan will help to understand how the Arctic Ocean will become one of the critical strategic

competition points among the three countries. Mahan's work shows that great powers must not surrender the maritime advantage to their competitors if they are determined to maintain (or increase) their status and position.

Mahan's core thesis explains the connection between great power status and sea power.[5] His writings have become required readings of all aspiring great maritime powers and are understood to provide a framework for the development of naval power. Writing as an American naval officer witnessing the rise of the American Navy at the end of the 1800s, he examined closely how great powers arise and how aspiring great powers attempt to challenge great powers.

While his study is best known for his examination of the rise of the maritime power of Great Britain and its ability to defeat the challenge of France, Mahan also mentions the success of Rome versus Carthage,[6] and the United Kingdom's ability to withstand the challenges of the Dutch. It would be equally easy to apply his writings to the relationship between the British and the Germans prior to WW I, and the Americans and the Japanese prior to WW II, and subsequently with the Soviets. In each instance the long-term great power was the one that was the most successful maritime power. Sea power and economic dominance are therefore completely interconnected. Mahan also argues that one of the critical elements of maintaining great power status through sea power is to ensure that any challenger or peer competitor does not have a safe zone. Likewise a challenger to the dominant existing power needs to ensure that it is able to challenge in *all* of the dominant state's maritime zones of influence. According to Mahan, if you cannot or will not challenge your maritime competitor, power cannot be sustained in the long term.

In this photo titled "Murderers' Row" after the term for the New York Yankees baseball team's heavy-hitters, five US Navy ***Essex****-class aircraft carriers anchor in Ulithi Atoll in December 1944. From 1943 onwards, the rapid wartime production of these fleet carriers enabled the USN to dominate the Pacific during the war, and much of the world's oceans afterwards.*

This leads to the better known elements of Mahan's theory – i.e., the need for a battle fleet which is able to provide for the protection of the great power's maritime interests and at the same time ensure that any competitor is not able to defeat it in a naval battle.[7] It was the existence of the British and Roman navies that allowed the two to protect their national interests and to defeat the maritime forces of any challengers. Rome and later the United Kingdom were able to continue as the hegemonic power of their time.

Supporters of Mahan's theory have argued that American dominance in the current international system is based on the existence of American sea power.[8] This has allowed the United States to dominate and ultimately defeat the core challengers to its power – Japan, Germany and the Soviet Union. By controlling the sea lines of communication, the Americans were able to bring the fight to the three challengers while protecting the North American continent. The United States was able to defeat the sea power of Japan and along with British assistance contained and defeated German sea power. The continued American dominance during the Cold War of the maritime approaches to Europe meant that the Soviet Union was ultimately contained to the Euro-Asian region.

If one accepts this line of argument, the conclusion is that the maintenance of maritime dominance in all regions of the globe is necessary to contain a challenger. Rome, the United Kingdom and the United States became and remained dominant powers of their time in part because of the ability of their navies to meet and destroy any challenger, anywhere.

Mahan and the Arctic

Mahan did not write specifically of the Arctic Ocean. This is not terribly surprising since when he was writing, the Arctic was frozen and the technology of the time did not facilitate naval forces entering the Arctic Ocean except at the fringes and only in extreme circumstances. As such, the Arctic remained off-limits for navies at that time.

This changed when the Americans developed nuclear-powered propulsion for their submarines which allowed them to transit under the ice cover of the ocean beginning in 1958 with the under-ice transit of the Arctic by USS *Nautilus*. This was soon followed by the Soviet Union which was also able to design and build nuclear-powered submarines, and already had dedicated icebreakers.[9] After this, the Arctic Ocean became a maritime zone of operation for the major powers just as the other oceans already

Credit: Arctic Submarine Laboratory, United States Navy

*Nuclear power allows submarines to operate in and under the Arctic ice with relative safety. In 1959, USS **Skate** conducted the first through-ice surfacing at the North Pole. Note the relatively thin ice sitting on top of the hull in this 1 April 1959 photo.*

were. The Soviet Union challenged the Americans but was ultimately unsuccessful.[10] There were numerous reasons for the American victory over the Soviet Union and included among them was the Mahanian principle of maritime dominance. Throughout the Cold War the United States was able to maintain its control through a superior navy that was able to contain much of the Soviet surface fleet and match its subsurface fleet worldwide and specifically in the Arctic.

Following the end of the Cold War, the Americans maintained their submarine forces, albeit with a class of more limited capability nuclear-powered attack submarines (*Virginia*-class). The Soviet fleet for the most part was allowed literally to rust away with only a small handful of submarines being maintained. The building of new ships was abandoned or put on a long-term pause. Throughout the 1990s and into the 2000s the US Navy was the dominant navy of the international system and the only one that could enter the Arctic Ocean.

But three factors began to alter the strategic importance of the Arctic. First, climate change has meant that the Arctic region is warming, and at a rate significantly higher than elsewhere on the globe.[11] This has resulted in a significant melting of the ice cover which is expected to continue until all of the permanent ice is gone. Second, the successor to the Soviet Union – Russia – under the leadership of Vladimir Putin began the process of rebuilding the Russian Navy. The focus has been on its submarine forces, thus allowing it to re-enter the Arctic Ocean.[12] The third factor, and one that has surprised many observers, has been the determination of China to become a peer competitor to the United States and to concentrate a significant proportion of its expanding military capabilities on the development of a powerful navy.[13] The Peoples Liberation Army Navy (PLAN) is in the process of becoming a blue-water navy which will then give it the ability to challenge the US Navy.

These three factors are fundamentally changing the Arctic strategic environment. As the ice recedes, as Russia rebuild its naval capabilities and as China moves to challenge the hegemonic power of the United States, the Arctic will become a critical strategic location. If Mahan's thesis that a challenger must have the capabilities to challenge the existing hegemon everywhere the hegemon operates is correct, then China must have the capabilities to enter the Arctic Ocean.

The geographic reality and core strategic interest of all three states means that the Arctic Ocean has to be a primary concern for all three. For both the Americans and the Russians, key elements of their nuclear deterrent forces are located within the Arctic region. This is particularly the case for Russia the northern fleet of which is now being modernized with the bulk of the new submarines.[14] Russia is also refurbishing many of its old air force bases in the Arctic to serve both for the protection of the expected increase in maritime surface traffic and to service its strategic air force capabilities.[15] The modernization of its deterrent has also required Russia to build up both its land and air capabilities in the region. This has created the situation in which Russian forces have emerged as the regional hegemon. The Russians have increasingly utilized this strength for power projection purposes.

The United States has also located some of its most important anti-ballistic missile systems in the North including its major base at Fort Greely, Alaska, and one of its most important radar sites at Tule, Greenland. As well, there are deployments of both F-22s and F-35s at Alaskan bases.[16]

As China's military capabilities expand, how does it plan to react to the forces of both the American and Russian

Credit: Russian Ministry of Defence

*The second **Borei**-class ballistic missile submarine **Alexander Nevsky** is pictured here in Vilyuchinsk, a closed city dedicated to submarine work on the Kamchatka Peninsula, 30 September 2015.*

nuclear deterrent? From a Mahanian perspective, this is probably one of China's most important long-term strategic challenges. If it is to emerge as a peer competitor to the United States, it cannot allow the Americans to have a safe sanctuary for their nuclear-powered submarines (SSBNs) in the Arctic. This is not to suggest that China will deliberately target American SSBNs but that it will need to develop a capability to complicate American strategy by being able to pursue American and Russian submarines into the region. The Chinese will also need to develop a means of countering the American dominance in anti-ballistic missile capabilities. To this end they are already investing in the development of hypersonic missiles that are intended to challenge American defensive capabilities.[17] Losing the ability to place their submarines under the ice cover to then emerge in a time of crisis may be one of the most serious maritime threats that the Americans will face in the future.

The last core strategic interest of China in the Arctic will be to deny the United States its dominance in the region. This is based on the observation that the Chinese intent is not simply to become a regional Asian power where it is already challenging American dominance, but in fact plans in the long term to challenge the United States as the global hegemon. China has embarked upon a massive military build up with a defence budget that continues to grow. Currently it has the second largest defence budget in the world at approximately US $228 billion in 2017 compared to the American budget of approximately US $597 billion. The third largest budget is Russia at about US $55 billion in 2017. There are questions as to whether or not the Russians will be able to maintain such a large budget, but the Chinese budget continues to be one of great growth and expansion. Since 1989 the Chinese published military budget has increased from under US $19.3 billion to over $108 billion by 2008 and it continues to grow at a rate that exceeds any other country.[18]

China has also been developing its Arctic policies and has focused on justifying its involvement in the region on the basis of its interest in climate change and science, international navigation, Arctic governance and the resource potential. It has been explicit in stating its acceptance of the norms and rules governing participation in the region. In its application to join as an observer state to the Arctic Council, China agreed to respect the interests and sovereignty of the Arctic states. However, it has never specifically stated its policies on whether or not it accepts the Russian and Canadian position that the North East Passage and Northwest Passage are internal waters or the American position that they are international straits. Equally important, the Chinese have yet to state any interest in the security dimension of the region.[19]

However, since 2015 China has begun to deploy elements of the PLAN to the region. In September 2015 five PLAN vessels appeared off the Aleutian Islands and sailed into the Bering Sea, a voyage that coincided with a visit of President Barack Obama to Alaska.[20] One month later three PLAN vessels (Fleet 151) made their first state visit to

The People's Liberation Army Navy (PLAN) undertook this major naval parade in the South China Sea in April 2018, demonstrating its new multi-mission navy potentially capable of challenging the US Navy for dominance at sea.

Sweden, Denmark and Finland. The one country they did not visit was Norway with which relations have remained difficult following the awarding of the Nobel Peace Prize to Chinese dissident Liu Xiaobo. A second state visit of Chinese naval vessels to Finland, Latvia and Russia occurred in September 2017. In 2018 Chinese vessels again made a port visit to Russia and engaged in a number of exercises with elements of the Russian Navy.[21]

The Chinese iebreaker *Xue Long* first visited Canadian waters in 1999 when the vessel made a port call to Tuktoyaktuk.[22] The vessel made the first Chinese transit of the Northwest Passage in September 2017, entering the eastern side of the passage on 1 September and exiting on the western side on 6 September .

The modernization of the Chinese navy has been one of the most important elements of the expansion of Chinese military capabilities.[23] China's military strategy released in May 2015 makes no mention of the Arctic. But it does make it clear that the Chinese are moving from a focus on a coastal anti-submarine warfare navy to the construction of an all-purpose blue-water navy that will give China a greatly expanded naval capability to engage worldwide.[24]

It is difficult to determine the importance to China of not only building new vessels that will give it a blue-water capability but also vessels that will give it a white-water capability. The Chinese have just constructed their second icebreaker, *Xue Long II*, but this is not officially a naval asset.[25] What is less known is that in 2016 the PLAN commissioned two new icebreakers of its own, the Type 272s, 5,000-ton vessels whose purpose is not yet understood, although the stated purpose is for icebreaking in the Yellow Sea.[26] Very little has been written on the intended use of these vessels and how they will complement the two better known Chinese icebreakers.

China's first indigenously-built (but Finnish-designed) icebreaker, ***Xue Long II****, is seen here during its launching in Shanghai on 10 September 2018.*

The most important question that remains relates to China's plans for its new submarine forces. The Chinese Navy has been focusing a significant portion of its modernization effort on the design and construction of several new classes of submarines. Of particular note for operations in the Arctic are the efforts to build a new class of attack submarines, SSN *Shang* (Type 93). China has already built two and is building four more. It is then planning to build a new class of nuclear-powered cruise missile submarines (the Type 95).[27] Recently China has become much more secretive regarding its submarine and naval construction, and it has become more difficult to determine its future plans with any certainty.

The critical question in regards to the Arctic is whether or not any of these new submarines have been given or will be given ice capabilities. It is not often appreciated that in order to operate under ice cover in the Arctic, nuclear-powered submarines need to be given certain capabilities beyond being nuclear-powered. These include, but are not limited to, having upward-looking sonar and retractable diving planes. There is also a very specific skill set that the commanders of such submarines need to acquire.[28] However the Chinese have already demonstrated that they are good students for teaching themselves how to operate in ice-covered waters as demonstrated by captains of their icebreaking vessels.

In conclusion, the United States remains the international system's hegemon and still has the only navy that is able to deploy to all regions of the globe including the Arctic. Russia is re-emerging as a major power and is the regional naval hegemon in the Arctic. China is displaying every intention of being able to challenge American maritime power and, one can assume, challenge the Russians as well in the long term. What this means is that by employing a Mahanian perspective, as well as understanding the geography and the special conditions of the ice cover, we can more realistically assess the developing power balance among China, the United States and Russia. Furthermore, by taking Mahan's theory into account we can predict that the Chinese – who read Mahan in their naval education! – will develop a means to challenge Russian and American naval power in the Arctic Ocean. Failing to do so would mean that China allows the United States and Russia to maintain their safe havens under the ice.

Credit: Mass Communications Specialist 2nd Class Edward Guttierrez III

*Two PLAN warships, the Type 052C destroyer **Jinan** (front) and the Type 054A frigate **Yiyang** turn in formation with three USN warships in the Atlantic Ocean on 7 November 2015.*

As Mahan has argued, this would mean ultimate failure in the long-term efforts to challenge the Americans and Russians. And this points to an Arctic that will become much more central to the overall geopolitical tensions of the international system.

Notes

1. Kristian Åtland, "Mikhail Gorbachev, the Murmansk Initiative, and the Desecuritization of Interstate Relations in the Arctic," *Cooperation and Conflict*, Vol. 43, No. 3 (2008), pp. 289-311.
2. Juha Käpylä and Harri Mikkola, *On Arctic Exceptionalism: Critical Reflections in the Light of the Arctic Sunrise Case and the Crisis in Ukraine*, Finnish Institute of International Affairs, Working Paper 85, 7 April 2015, pp. 4-9, available at www.fiia.fi/en/publication/on-arctic-exceptionalism.
3. Jeremy Bender, and Mike Nudelman, "This Map Shows Russia's Game-Changing Militarization of the Arctic," *Business Insider*, 2015, available at www.businessinsider.com.au/chart-of-russias-militarization-of-arctic-2015-8.
4. Rob Huebert, "The Arctic and the Strategic Defence of North America: Resumption of the "Long Polar Watch," in Christian Leuprecht, Joel Sokolsky and Thomas Hugh (eds), *North American Strategic Defence in the 21st Century: Security and Sovereignty in an Uncertain World* (Switzerland: Springer International Publishing, 2018), pp. 182-183.
5. Alfred Thayer Mahan. *The Influence of Sea Power upon History 1660-1805* (Englewoods Cliffs, New Jersey: Prentice-Hall, 1980), pp. 30-67.
6. *Ibid*., pp. 23-29.
7. *Ibid*., p. 67.
8. James Stavridis, *Sea Power: The History and Geopolitics of the World's Oceans* (New York: Penguin Press, 2017), pp. 309-321.
9. Richard Compton-Hall, *Submarine vs Submarine: The Tactics and Technology of Underwater Confrontation* (Toronto: Collins, 1988), pp. 79-85.
10. Norman Polmar, *Soviet Naval Power: Challenge for the 1970s*, Revised edition, Strategy Papers, No. 13, National Strategy Information Center (New York: Crane, Russak for National Strategy Information Center, 1974).
11. Susan Hassol, *Impacts of a Warming Arctic: Arctic Climate Impact Assessment* (Cambridge: Cambridge University Press, 2004).
12. Swedish Ministry of Defence, "Russian Military Capability in a Ten-Year Perspective - 2016," Gudrun Persson (ed.), Swedish FOI, 2016.
13. James R. Holmes and Toshi Yosihara, *Chinese Naval Strategy in the 21st Century* (New York: Routledge, 2008); and *Red Star over the Pacific: China's Rise and the Challenge to the US Maritime Strategy* (Annapolis, Maryland: Naval Institute Press, 2010).
14. Thomas Nilsen, "Russia Rearms Strategic Forces: Satellite Images Show Expansion of Nuclear Weapons Sites on Kola," *Barents Observer*, 2017.
15. Bruce Jones, "Russia to Re-Open Three Arctic Military Bases," *Jane's Defence Weekly*, June 2012.
16. Dorothy Chomicz, "Air Force Hosts Meeting in Fairbanks on Proposed F-35 Fleet for Eielson," *Fairbanks Daily News-Miner*, 2015.
17. Liu Zhen and Kristin Huang, "China Just Tested a New Hypersonic Weapon – and Observers Think It's a Clear Warning to the US," *Business Insider*, 8 August 2018, available at www.businessinsider.com/chinas-hypersonic-weapons-test-likely-a-warning-to-the-us-2018-8.
18. All numbers are from Stockholm International Peace Research Institute, SIPRI Military Expenditure Database.
19. Whitney P. Lackenbauer, Adam Lajeunesse, Frederic Lasserre and James Manicom, *China's Arctic Ambitions and What They Mean for Canada* (Calgary: University of Calgary Press, 2018). Also for the best collection of Chinese statements – official and non-official – on Arctic Security, see David Wright, "The Dragon and Great Power Rivalry at the Top of the World: China's Hawkish, Revisionist Voices Within Mainstream Discourse on Arctic Affairs," Canadian Global Affairs Institute, Policy Paper, September 2018.
20. Phil Stewart, "Five Chinese Ships in Bering Sea as Obama visits Alaska," *Reuters*, 2 September 2015.
21. Gerald O'Dwyer, "Russia-China Exercise: Kremlin Moves to Calm Nordic-Baltic Fears," *DefenceNews*, 4 August 2017.
22. Aldo Chircop, "The Emergence of China as a Polar-capable State," *Canadian Naval Review*, Vol. 7, No. 1 (Spring 2011).
23. Ronald O'Rourke, "China Naval Modernization: Implications for U.S. Navy Capabilities, Background and Issues for Congress," Congressional Research Service, 7-5700, 1 November 2017.
24. Alex Pape and Tate Nurkin, "China's Naval Strength," in Andrew S. Erickson (ed.), *Chinese Naval Shipbuilding: An Ambitious and Uncertain Course*, Annapolis, Maryland: Naval Institute Press, 2016, pp. 107-133.
25. Xinhua, "First Chinese-Built Polar Icebreaker to Come into Use in 2019," *China Daily*, 4 April 2018.
26. China Military Online, "New Icebreaker joins PLA Navy in Liaoning," *China Miliary News*, 1 May 2016.
27. O'Rourke, "China Naval Modernization," pp. 10-15.
28. Marin D. Williams, *Submarines under Ice: The U.S. Navy's Polar Operations* (Annapolis, Maryland: Naval Institute Press, 1998).

Dr. Rob Huebert is at the University of Calgary.

China's Arctic Policy and its Potential Impact on Canada's Arctic Security

Sherman Xiaogang Lai

Credit: Bahnfrend, Wikimedia

*China's first research icebreaker, the Ukrainian-built converted freighter named **Xue Long**, departs Fremantle, Australia, in March 2016 after a mission to Antarctica.*

The People's Republic of China (PRC) is not an Arctic country but it was admitted into the Arctic Council in 2013, making the total at that time 12. (Today there are eight member states, plus 13 observer states as well as 13 inter-governmental organizations and 13 non-governmental organizations.) The PRC is, nevertheless, not content with its current status and is determined to increase its voice in Arctic affairs by exploiting the Arctic situation for its economic and financial strength.[1]

It has been 40 years since Deng Xiaoping (1904-1997) started his market-oriented economic reforms in 1979. Through abandoning China's Stalinist command economy and trading with the West (including Japan), Deng's reforms brought the Chinese people a good life that their ancestors had not dreamed of. Trading with the West also enabled the ruling Chinese Communist Party (CCP) to build up a modern air force and a blue-water navy while providing it with sufficient financial resources to become a state with global influence. But, contrary to the expectations of the West that economic liberalization would lead to democratization, since 2012 the PRC has moved toward dictatorship under Xi Jinping's leadership.[2] As well, Deng's economic reforms did not help solve a set of explosive issues inherited from Imperial China and the CCP revolution (1921-1949). Among the issues that remain to be resolved are the South China Sea, Taiwan and Korea. These issues directly concern the legitimacy of the CCP's rule. China's Arctic policy, therefore, has to be examined in the context of its domestic politics and its geopolitical and geostrategic concerns.

The PRC's Arctic Policy

In January 2018, five years after it was admitted into the Arctic Council, the PRC government released a 10-page white paper, "China's Arctic Paper."[3] The white paper claims at the beginning that the melting of the Arctic sea ice has profoundly raised the Arctic's strategic value as the intersection between North America, Europe and East Asia, as a region of unexploited resources such as natural gas, oil and fish stocks, and as the birthplace of storms that will affect the entire northern hemisphere. The melting Arctic, according to the white paper, has a "direct an impact on China's climate system and ecological environment, and, in turn, on its economic interests in agriculture, forestry, fishery, marine industry and other sectors." China, the white paper claims, is therefore a "Near-Arctic State" and "an important stakeholder in Arctic affairs."

China also has "rights in respect of scientific research, navigation, overflight, fishing, laying of submarine cables and pipelines, ... and rights to resource exploration and exploitation in the Area," as stipulated in treaties such as UNCLOS and the Spitsbergen Treaty, and general international law." In addition, as a permanent member of the UN Security Council, China "shoulders the important mission of jointly promoting peace and security in the Arctic."[4]

In other words, the PRC government believes that China is entitled to rights in Arctic affairs. The white paper states that China is capable of claiming its rights of "utiliz[ing] sea routes and explor[ing] and develop[ing] the resources in the Arctic."[5] The white paper goes further by saying that "China's capital, technology, market, knowledge and experience is expected to play a major role in expanding the network of shipping routes in the Arctic and facilitating the economic and social progress of the coastal States along the routes." The white paper states that China's goals and approaches in the Arctic are "to understand, protect, develop and participate in the governance of the Arctic, so as to safeguard the common interests of all countries and the international community in the Arctic, and promote sustainable development of the Arctic." As proof to support China's right, the white paper traced China's participation in the Svalbard Treaty in 1925 that acknowledges each state's right in Arctic research. International law thus is the PRC's foundation to participate in the Arctic affairs.

There is, however, a critical problem concerning the PRC's justification of its rights in the Arctic. It was the government of the Republic of China (ROC) – i.e., what became the West-friendly Taiwan – rather than the PRC that joined the Svalbard Treaty. At its birth in 1949, the

Credit: Xinhua

Vice-Minister of Foreign Affairs, Kong Xuanyou, holds a copy of China's Arctic White Paper during a press briefing in January 2018.

Credit: Marqueed, Wikipedia

Shanghai is the world's busiest port, playing a key role in China's post-Deng Xiaoping turn towards greater global market integration.

PRC government denounced the international obligations of China's preceding governments. In contrast, the ROC government honoured the international treaties that the Chinese Imperial government had signed when it came into being in 1912. The PRC thus voluntarily gave up its entitled rights in the Arctic at its birth. Moreover, the PRC committed itself to anti-West revolutionary wars for 20 years, even disregarding the Soviet Union's advice of caution. The PRC did not try to work with the West until the late 1970s. By then, the PRC leaders were facing a Soviet military threat and a financial crisis. Through forming a de facto alliance with the West, the PRC under Deng's leadership could not only ignore the Soviet military menace but also overcome its financial crisis. When the West opened its markets to the PRC, Deng started his market-oriented reforms.

During the process, the PRC leaders came to know the United Nations Conventions on the Law of the Sea (UNCLOS) and learned that China was entitled to some maritime rights and could benefit tremendously from international collaboration.[6] Among the earliest benefits was China's successful Antarctic program in the mid-1980s.[7] Another benefit was controlling some atolls in the disputed Spratly Islands in the South China Sea in 1988. China conducted this operation in the name of implementing a resolution of the United Nations Educational, Scientific and Cultural Organization (UNESCO) to build a few observation stations in the South China Sea. The operation led to a China-Vietnam naval skirmish in March 1988.[8] It foreshadowed the current escalated tension in the South China Sea and reflected the PRC's pragmatic attitude toward international law. When the Permanent Court of Arbitration at the Hague (PCA) concluded in July 2016 that a China-controlled shoal in the Spratly Islands belongs to the Philippines, the spokesman of the Chinese Foreign Ministry termed the arbitration decision a "piece of waste paper."[9] Although compliance with PCA rulings is voluntary, it goes without saying that China's attitude

Credit: Mass Communication Specialist Elliott Fabrizio

Despite tensions, American and Chinese naval dialogues continue. Here, USN Chief of Naval Operations Admiral John Richardson visits the Chinese navy's Command College in Nanjing on 15 January 2019.

toward the PCA's arbitration raised suspicion over its sincerity about international law on which its Arctic policy is founded.

Nationalism and the Legitimacy of the CCP's Rule

The PRC's pragmatic use of international law in the Arctic and the South China Sea comes from its attempt to preserve the CCP's legitimacy to rule China, a constant challenge that it has faced since its birth in 1921 in its rivalry against Chinese Nationalists. The CCP was a creation of the Soviet Union's efforts to export its Bolshevik revolution through the Communist International (Comintern) association (1919-1943). Communism therefore became the basis of the CCP's legitimacy. Moscow convinced the leaders of the influential Nationalists, who were determined to unify the country, to form a coalition with the CCP in exchange for Moscow's military and financial assistance. The CCP then exploited the Nationalists' efforts of national unification, and the outcome was the First Nationalist-CCP war (1927-1937). Japan's invasion of China saved the CCP from destruction. During China's war of resistance (1937-1945), the CCP followed Moscow's instruction and accepted the leadership of Chiang Kai-shek and his Nationalist government. After Japan surrendered, the CCP refused to put its army under the Nationalist government's command. The Second Nationalist-CCP war (or the Chinese civil war) (1946-1949) thus broke out. With Moscow's limited but essential covert military assistance, the CCP defeated the Nationalists and drove them to the island of Taiwan in 1949. The CCP's victory strongly encouraged its North Korean comrades and triggered the Korean War in 1950. As a part of its efforts to stop communist aggression worldwide, the United States sent its navy to patrol in the Taiwan Strait. The Republic of China therefore survives in Taiwan.

Taiwan forms a constant challenge to the CCP's legitimacy to rule China. Nationalism and national unification formed the basis of the Nationalists' legitimacy. The CCP's foundation was social justice based on communism, although it also shared the goal of nationalism and unification. After it took over China, to maintain its legitimacy, the CCP had to outperform the Nationalists domestically and internationally. Mao Zedong, the PRC's founder, therefore, was determined to industrialize China and show off China's strength. And one of the show-offs was an Antarctic exploration that was proposed for the first time in 1964.[10] But the PRC did not have the necessary resources following Mao's programs of industrialization that cost over 30 million people's lives in three years, and threw the country into turmoil. Exploration was thus delayed until 1984, five years after Deng started his economic reforms and led China back to the West-led international community.

The PRC's Antarctic program was based on international collaboration. With many countries' assistance, China built up its first Antarctic station in 1984 and obtained valuable experience in polar research. China's Arctic program was a post-Cold War extension of its Antarctic program. The end of the Cold War fundamentally reduced the Arctic's value in national defence. At the same time, Soviet Arctic technologies, including a half-finished ice-strengthened freighter which China converted into an icebreaker, became accessible to China. The State Oceanic Administration (SOA), which was in charge of the PRC's

maritime affairs, seized the opportunity and started China's Arctic program in the mid-1990s.[11] When it became clear that the Arctic sea ice was melting, a situation that would bring profound changes to the geopolitical posture in the northern hemisphere, Beijing found itself, in the mid-2000s, in a position to have its voice heard in Arctic affairs.

The sudden conclusion of the Cold War turned the issues of Taiwan and South China Sea into critical threats to the PRC. Global attention was no longer focused on the confrontation between the United States and the Soviet Union, and China had quietly become an economic power that relied heavily on imports and exports traveling by sea. Taiwan was on the track toward de jure independence while the South China Sea countries consolidated their control over the atolls and shoals that China claimed as its territory. The two issues of China's territorial integrity and national unification became a focus in Beijing. Thanks to its alliance with the United States, the naval force of the Nationalists in Taiwan was a powerful force in East Asia. But Taiwan's naval forces had to concentrate their resources on the defence of Taiwan against the CCP. Mao ignored the South China Sea until oil deposits were discovered in its seabed in the early 1970s. Before Mao took any action, other South China Sea countries had controlled a number of disputed atolls and shoals in the Spratly Islands. The question of how to improve China's position in the territorial disputes thus became urgent.

In order to dominate the South China Sea and to deter Taiwan from independence, the PRC developed a maritime-oriented military strategy in 1992.[12] The outcome of the implementation of this strategy has been the development of China's naval and air superiority in the South China Sea. Nevertheless, instead of a sense of security, a number of PRC's military strategists found their country falling into a security dilemma. Although China's booming economy could afford to build a modern navy, it was dependent on overseas trade and the shipping through Malacca Strait. But China cannot control the Malacca Strait without defeating the US Navy and winning a major war against the United States. The more powerful the Chinese navy grows, the more uneasy the situation in the South China Sea becomes and the less secure the PRC leaders feel. As China's maritime-oriented military strategy was guiding the country to nowhere, the prospect of a commercially beneficial Northern Route became an option for China to go around the southern impasse.

China's Arctic Strategy and Its Potential Impacts on Canada

China's commitment to Arctic affairs is rooted in China's economy. Beneath the high-toned sentences in the white

Credit: Liu Hongxia, Xinhua

*One of China's new purpose-built Arctic cargo ships, **Tian En**, transits the Northern Sea Route in this 20 August 2018 photo.*

paper outlining China's Arctic policy, are the shrewd geostrategic considerations and well-developed plans that have been in existence for over 15 years. As early as the mid-2000s, Chinese engineers started designing high ice class merchant ships.[13] In August 2018, at least two Chinese high ice class merchant ships were in commercial operations in the Arctic. China's shipbuilding industry is therefore ready for Arctic shipping. In the meantime, the SOA implemented a comprehensive research program on the history, politics, economy and society of the Arctic countries.[14] The implementation of the program helped PRC governmental agencies and academia achieve a consensus on China's Arctic strategy. Although the consensus has not been explicitly articulated, its principal contents can easily be identified in the publications open to the public. In addition to the principles of international collaboration, international law and contributions to Arctic research and the well-being of Arctic countries, which are addressed in the white paper, Russia-China partnership and mediation of the difference among Arctic countries are among the key components in the consensus.

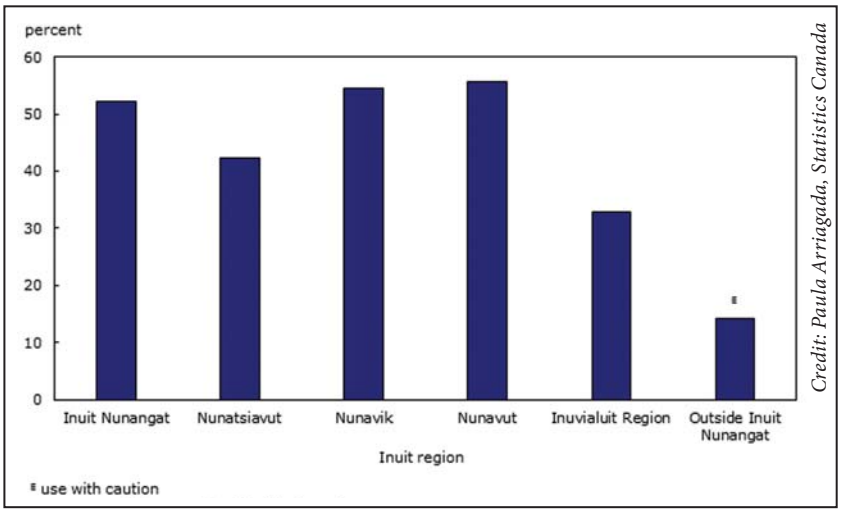
China and Russia formed a quasi-alliance after the Cold War due to their geostrategic need to counterbalance the United States and its allies. Their bilateral history, however, has not been without difficulties, and currently Russia is concerned about the security of Siberia and China's growing influence in Central Asia. The Arctic Route is the best approach to consolidating Russo-China relations without touching these sensitive issues. Collaboration with Russia is thus essential in China's Arctic strategy. With Russia's consent, even support, China could use its financial and economic strength to mediate controversies among Arctic countries and gradually alter its current status within the Arctic Council.

Chinese participation in the Arctic has several interesting potential benefits for China. For example, China could use Canada's argument that the Northwest Passage is historic internal waters, to argue that the South China Sea is also historic internal waters of China. This would be a pragmatic use of Canada's legal arguments to counter criticism of Chinese actions.

As well, in addition to studying the various current and potential controversies among Arctic countries, Chinese researchers also studied the internal challenges of the Arctic states, especially the deplorable history of indigenous peoples within the Arctic Circle. A number of works on Arctic indigenous societies have been published. Among the works is a monograph on Canada. Pan Min, the author, examined the relations between the aboriginal communities and the provincial and federal governments.[15] She discussed the socioeconomic disparities between the Arctic and south Canada. She suggested that the PRC government should adopt a strategy of 'wait-and-see' about the indigenous issues while increasing investment in the indigenous areas.

It goes without saying that Pan's suggestion was based on the PRC's interests rather than the well-being of the Canadian indigenous peoples. In the context of the PRC's post-Cold War strategic dilemma and the opportunities to be developed out of the melting of the Arctic sea ice, Pan's suggestion shows that the PRC leaders have been searching for the weak and exploitable points of the Arctic countries. And they have identified the issue of indigenous people. It is the same issue that PRC diplomats in Australia have directly threatened to use if necessary.[16] Fortunately for Canada, China's current interests in the Arctic are around the Northern Sea Route rather than the Northwest Passage. Unfortunately for Canada, the PRC has little stake in Arctic Canada. This implies that the PRC could use indigenous issues in the Arctic to rebuke or embarrass the Canadian federal government when it feels unhappy with Canada's criticisms or wants to divert public attention (domestic or international) away from China. The Arctic indigenous issue is thus leverage for the PRC to restrain the Canadian government's freedom of movement.

Proportion of Inuit adults aged 25 and over who experienced food insecurity in the previous 12 months, by Inuit region, 2012



A chart from a Statistics Canada report shows over half of Canada's Inuit population have experienced food insecurity over a one year period. The dramatic disparity in food security between Canada's northern indigenous peoples and southerners may be exploited by foreign actors.

Credit: US Navy

*China's challenges to the US Navy in the South China Sea have taken numerous forms short of violent conflict. Here, China's maritime militia interfere with the American naval research ship USNS **Impeccable**'s towed-sonar array south of Hainan Island in March 2009. Neither wishing to fight an actual war nor able to discourage the United States from operating in the South China Sea, China is increasingly interested in using Arctic waters for its maritime trade.*

Conclusion

The PRC has committed itself to Arctic affairs. The origin of its polar policy was Chinese nationalism that led to its Antarctic exploration program. And its commitment to the Arctic comes, in part, from China's maritime security dilemma over the issues of Taiwan and the South China Sea, and relates to maintaining the CCP's legitimacy to rule China. As well, the PRC's commitment to the Arctic is intended to consolidate China's relations with Russia in order to reduce Russia's concern over the security of Siberia and China's growing influence in Central Asia. Canada's position in China's geostrategic plan and Arctic strategy is marginal but Canada's peripheral position might make it an easy target for China to exploit. And the issue of Arctic indigenous people appears to be the issue that China could use to mute Canadian government criticism, divert China's domestic attention, or use in exchange for agreement about issues somewhere else. China's Arctic policy therefore could form an indirect and long-term threat to the security of Canada's Arctic.

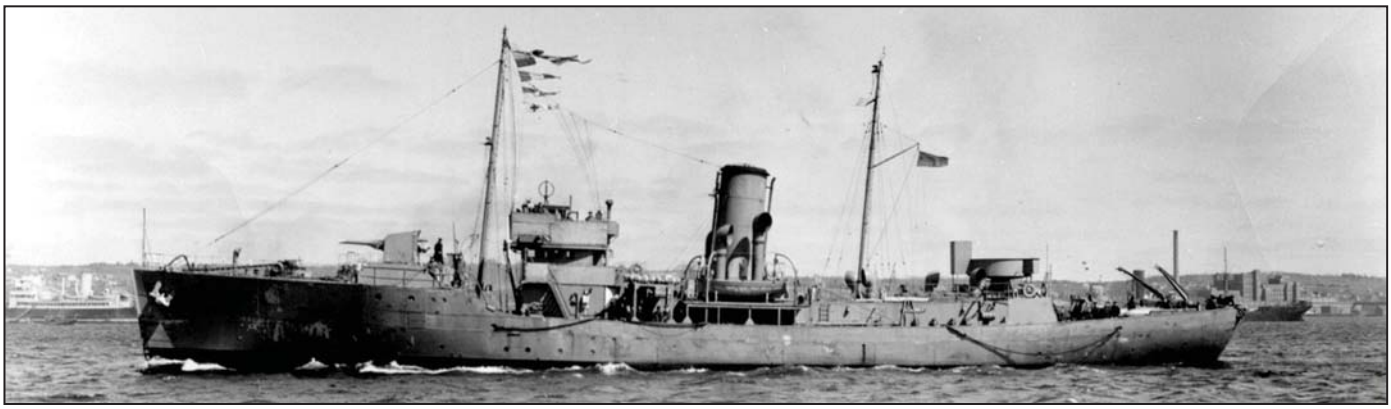
Notes

1. Zhao Ningning, "China and the Paradigm of the Arctic Governance" (translated title), *Socialism Studies*, No. 2 (2018), pp. 133-140.
2. "Vice President Mike Pence's Remarks on the Administration's Policy Towards China," Hudson Institute, Washington, DC, 4 October 2018, available at www.hudson.org/events/1610-vice-president-mike-pence-s-remarks-on-the-administration-s-policy-towards-china102018.
3. See the State Council Information Office of the People's Republic of China, "China's Arctic Policy," English version, January 2018, available at http://english.gov.cn/archive/white_paper/2018/01/26/content_281476026660336.htm.
4. *Ibid*., Section 1.
5. *Ibid*.
6. Dumitulu Majilu, "Exclusive Economic Zones" (translated by Liu Nanlai), *Global Law Review*, No. 6 (1980), pp. 42-64; Mololianyoufu, "On the New Phase of the International Law of the Seas" (translated by Liu Nanlai), *Global Law Review*, No. 1 (1979), pp. 60-67; I.K. Kolosovsky, "The Significance of the UNCLOS and the Approaches to Obtaining Worldwide Supports for it" (translated title), *Global Law Review*, No. 4 (1990), pp. 51-54.
7. Hu Lingtai, "Antarctic Exploration and Research" (translated title), in Center for Scientific and Technological Information of State Oceanic Administration (ed.), *China Ocean Yearbook*, *1986* (Beijing: Haiyang Chubanshe, 1988), p. 457.
8. Liu Huaqing, *Liu Huaqing's Memoir* (translated title) (Beijing: Jiefangjun Chubanshe, 2004), pp. 539-540.
9. Chua Chin Leng, "What is the Permanent Court of Arbitration?" *China Daily*, 14 July 2016 available at www.chinadaily.com.cn/opinion/2016-07/14/content_26091459.htm.
10. Xie Zichu, "Zhu Kezhen: The Pioneer of China's Polar Studies" (translated title), in Wu Chuanjun and Shi Yafeng (eds), *A Collection of Memories of China's Geography of Ninety Years* (Beijing: Xueyuan Chubanshe, 1999), p. 25.
11. Sheng Aimin, "The Preparations for the Arctic Exploration" (translated title), in *China NGO Research* (translated title), No. 7 (1994), pp. 17-18.
12. Sherman Xiaogang Lai, "China's Post-Cold War Challenges and the Birth of its Current Military Strategy," *Journal of Military and Strategic Studies*, Vol. 16, No. 4 (2016), pp. 182-209.
13. Zhang Dongjiang, "Analysis of Arctic Marine Shipping and Research on Arctic Ship General Performance" (translated title), MA Dissertation, Harbin Engineering University, March 2012.
14. Li Zhen-fu, "Analysis of China's Strategy on Arctic Route" (translated title), *China's Soft Sciences*, No. 1 (2009), pp. 1-7; Li Zhen-fu, "China's Opportunities and Challenges from the Arctic Route" (translated title), *Journal of Port and Waterway Engineering*, No. 8 (Serial No. 430) (August 2009), pp. 7-15; Li Zhen-fu, "The Dynamics of the Arctic Route in Geopolitics" (translated title), *Inner Mongolia Social Sciences*, Vol. 32, No. 1 (2011), pp. 13-18.
15. Pan Min, *Researching Arctic Indigenous People* (translated title) (Beijing: Shishi Chubanshe, 2012), p. 314.
16. Clive Hamilton, *Silent Invasion: China's Influence in Australia* (Melbourne: Hardie Grant Books, 2018), p. 280.

Dr. Sherman X. Lai, a PhD graduate at Queen's University (2008) and MA graduate of War Studies at Royal Military College (RMC) (2002), is an Adjunct Assistant Professor with the History Department, Queen's University, and Department of Political Science, Royal Military College of Canada.

Technology and Growth: The RCN during the Battle of the Atlantic

Acting Sub-Lieutenant L.J.W. Cole*



Credit: Royal Canadian Navy

*HMCS **Chambly**, the first Canadian corvette to sink a U-boat, is pictured in Halifax, summer 1941, as a perfect example of the first iteration of Canadian **Flower**-class corvettes with two masts and the forecastle deck ending just before the bridge.*

The Royal Canadian Navy (RCN) was a small force when the Second World War commenced in 1939. That it would grow and take on the role that it did in the Battle of the Atlantic was not expected by the few officers and sailors who manned the ships in 1939. The war-time maritime role that Canada played was significant, but it was a difficult role to play as technology changed and the navy tried to adapt. The rapid growth of the fleet contributed to problems of effectiveness as important improvements in technology were not being introduced because no one wanted to slow down production. This led to a crisis at the end of 1942, when RCN ships were removed from the important task of Mid-Ocean Escort Duty. The RCN ships were lagging behind the Royal Navy (RN) and US Navy in terms of radar, asdic and weapons technology.

This article will look at the development of the technology of the RCN fleet during the Second World War, how that differed from the Royal Navy, and how this related to the effectiveness of the RCN in the war effort.

The Problems of Expansion and Modernization

With the declaration of war in 1939, the RCN raced to increase the size of its escort fleet, instituting the rapid production of the *Flower*-class corvette. When the first program to build corvettes was implemented in 1940, it was quickly fulfilled. By late 1940, 64 *Flower*-class corvettes were on order in Canadian shipyards for the first shipbuilding program, with the bulk (52) being delivered in 1941.[1] The corvette design was based on a whaler that had been adapted for use by the RN when the need for inexpensive escorts became clear. They were built to civilian standards, emphasizing ease of construction.

The RN quickly made alterations to lengthen the forecastle, raise the bow and enclose the bridge in an effort to improve the ships. However, in order not to slow production, the RCN did not make these changes even as the ships were under construction. This meant that the ships were equipped from the beginning with inferior equipment. And consequently, many Canadian-made corvettes

Credit: Royal Canadian Navy

*HMCS **Eyebright** is pictured here around 1943 as an example of a mid-war modified **Flower**-class corvette. In the modified ships, the forecastle deck was extended to midships, the mast was moved to aft of the bridge, and the lantern-shaped Type 271 radar was located between the mast and bridge.*

were already outclassed by ships built in Britain. Between 1940 and 1943, these first and second build program ships became increasingly outdated, compared to the sophisticated escorts of the RN.

The RCN rapidly fell behind in technology, becoming less effective as both the RN and German U-boats became more advanced.[2] This was because, despite the fact that hulls could be built rapidly, Canada had virtually no domestic maritime high technology industry and the British, and eventually the United States when it joined the war, were in short supply themselves.[3] Eventually Canadian industry was built up but it was not ready in time for the critical job of escort duty in the early years of the war. At the beginning, the Canadian shipyards could only build ships the size of corvettes, and only as the war progressed did the yards grow in size and experience, eventually building destroyers.

The largest difference between the RN and RCN corvettes was their weapons and sensors. The RN anticipated that the corvette would be an ocean escort and made continual improvements, while focusing the ship for anti-submarine warfare (ASW). However, the first 54 RCN ships had both anti-submarine warfare (ASW) weapons and minesweeping gear on the stern, not the bow, which reduced their ocean-going capabilities. The Canadian view was that these ships were 'jack-of-all-trades' vessels, operating inshore where the threat had been in the last war. This reflected a major difference in perceptions between Canada and Britain on what the threat was, and what the focus of maritime operations should be to address it.

The Canadian government resisted making changes to the design at first, and even as the needs became clear, six more of the original design were built without minesweeping and anti-submarine gear. Then 10 'Revised' ships, which featured changes the RN had adopted, were included in the second build program in 1940-1941.[4] Finally, 27 'Increased Endurance' (IE) escorts were delivered in late 1943.

The problems of modernization and repair had an impact on the function of the RCN escorts. When it became time to modernize to the IE standard, a new electrical system had to be installed. All the large yards were already busy with new construction. Only smaller yards could slowly do this work, and with the anticipation of newer ships joining the fleet, Naval Service Headquarters (NSHQ) put modernization lower in priority than construction.[5] Only 20% of RCN corvettes were modernized to the same level as all the RN corvettes by October 1943.[6]

The *Castle*-class was the next iteration of corvette. Possessing the structural changes from the 'Revised Increased

Credit: Imperial War Museum, A24759

*HMCS **Tillsonburg**, a **Castle**-class corvette, is seen on 15 July 1944, in Greenock, Scotland. Incorporating many of the midwar modifications to the **Flowers**, the **Castles** were around 15 metres longer than their predecessors and were much more seaworthy. Note the more robust lattice mast, allowing the ships to locate the Type 271 radar at a higher elevation and likely improving its range.*

Endurance' ships, 12 were acquired by the RCN, none of which were constructed in Canada.[7] Delivered near the end of 1943, these ships featured the equipment that RCN corvettes were missing, including: forward-throwing depth charge launchers; Type 147B asdic; and Type 272 radar, an improved version of the Type 271.[8] Interestingly, due to the fact that the RCN was now receiving the improved corvettes and frigates, modernization of the rest of the fleet slowed, leading to the large disparity in equipment between ships within Canadian escort groups.[9]

In an effort to become more effective, the RCN sought to acquire frigates. The frigate was designed to fix the shortcomings of the corvettes. Larger, faster and with a longer range, they were equipped with the latest radar, asdic and weapons. Unfortunately for the struggling RCN in 1942, the frigates it ordered had lower construction priority than those being built in Canada for the RN and USN. Even when the RCN asked to take some frigates that were advanced in construction, the Canadian government denied the request as the USN and RN ships being constructed were a source of money and expertise the Canadian government felt it could not afford to lose.[10] Therefore, the majority of the *River*-class was delivered to the RCN between 1943 and 1944, long after the crisis period for the RCN in late 1942.[11] Ultimately, 70 *River*-class frigates were built in Canada for the RCN, RN and USN.[12] However, instead of ordering the more technologically-advanced second generation *Loch*-class, the RCN decided not to wait and took over *River*-class frigates that the RN was having trouble manning, cancelling its *Loch*-class building program.[13] In May of 1943, a number of British *River*-class destroyers were given to the RCN. These destroyers had just returned from refit with all up-to-date equipment,[14] and were useful for the RCN war effort.

The most advanced class of destroyer to enter service with the RCN during the Second World War was that of the British-built *Tribal*-class. Heavily armed with four quick firing guns and heavy torpedoes, the ships were also well equipped with radar and asdic. However, as they were designed for surface combat, they were relegated to the RN Home Fleet, and not used as escorts.[15] Due to Canada

Credit: Library and Archives Canada

***Flower**-class corvette HMCS **Weyburn**, circa 1942. Illustrating the somewhat ad hoc approach to corvette modernization, **Weyburn** is shown here with the triangular Canadian-developed SW1C radar at the top of the mast and wider bridge wings, yet lacking some of the newer modifications such as an extended forecastle.*

being so closely tied to Britain, the British Admiralty could still issue orders for the RCN. The RCN wanted destroyers to create its ideal balanced fleet, but the RN was short on manpower, meaning the solution was Canadian-crewed ships to accomplish British tasks. Regardless, they arrived too late to participate in the convoy battles of 1942, when the RCN escort groups needed well-equipped destroyers. The Canadian government instituted a program to build *Tribals* in Canada but they entered service in September of 1945, too late to be used as escorts in the war.

The continued lack of up-to-date equipment, combined with NSHQ vacillating over which course to follow and the inability of the shipyards to modernize the corvettes quickly led to the decreasing effectiveness of the Canadian escort groups in protecting convoys and sinking U-boats. This prompted the RCN to be pulled out of the Mid-Ocean Escort Force at the end of 1942 until the summer of 1943 in order for it to re-equip, retrain and re-organize. It was during this period that the allies finally began gaining the upper hand in the Atlantic and by the time the Canadian groups returned, the situation had stabilized.

NSHQ continued to resist modernization of its corvettes, knowing that modern escorts were going to be available in the near future. As such, Canadian escort groups for the remainder of the war remained a motley assembly of highly advanced *River*- and *Castle*-class escorts, mixed in with *Flower*-class escorts which still had the ineffective radar and obsolete Type 123D asdic.

Radar

With the commencement of hostilities in 1939, the RN began equipping its escorts with radar. In addition to the structural updates, the RN also ensured every ship had a gyrocompass, which provided a stable directional reference. In contrast, even at the end of 1942, the RCN only approved gyrocompasses to be fitted on new construction; no provisions were made for fitting out the ships that were in combat.[16]

But it was radar that would prove to be the key for protecting convoys and sinking U-boats. The preferred method of attack for German submarines at this point was the nighttime surface attack. On the surface, the U-boat would use its superior surface speed in order to move into firing position. Remaining on the surface during the daylight hours would leave the boat vulnerable to being spotted, therefore, night attacks were the only option to maximize the advantages of the U-boats. To counter this, the allies began outfitting ships with increasingly powerful versions of radar. The first versions of radar had microwave beams that were in the metre length; satisfactory for detecting large surface vessels, but inadequate to detect submarines that were on the surface.

Starting in 1941, the RCN and the National Research Council began the research and construction of a 1.5 metre wave radar. An upgrade to the Type 286, the Surface Warning, First Canadian – or SW1C for short – was capable of sweeping side to side instead of just being fixed

forward, as the previous version was.[17] In testing against a surfaced Dutch submarine, the radar performed very well but was sensitive to shock and required constant maintenance. Furthermore, its wavelength reduced its ability to provide a sharp image, something needed to identify a submarine in the clutter of waves on the ocean. Fitting was slow, and only a quarter of the Canadian escort fleet was equipped by the end of 1941. By the end of the winter in 1942 all of the ocean escorts of the RCN had radar, either the Type 286 or SW1C. The SW1C was updated, with improvements, to the SW2C and SW3C variants.

However, the RCN radar systems retained the core problems of long-wave radar systems.[18] As well, fitting Canadian escorts with the improved Type 271 radar took much longer than expected, hampering the RCN at a critical time. Designed and tested concurrently with SW1C, the Type 271 was a major upgrade. It had a 10 centimetre wave length which greatly increased its image sharpness. It could detect surfaced U-boats and periscopes in moderate conditions. Covering 360 degrees, escorts could now detect U-boats as they prepared to attack. The RN quickly refitted its escorts with these updates, but the RCN was slower. Thus, while the RCN was just beginning to equip its escorts with the SW1C in January 1942, the RN had already refitted 78 escorts with the Type 271.

Canadian efforts to acquire the centimetric system were challenged by misunderstandings and bad timing. After being informed of the benefits of this type of radar in the summer of 1941, the NSHQ and National Research Council worked to develop a Canadian version, asking the RN for a set to copy. Unfortunately, the set was not delivered until January 1942, after development of the Canadian short-wave set – RX/C – had begun, leading to delays as Canadian scientists worked from scratch. NSHQ hoped to receive sets from the United States but the US Navy radar became increasingly difficult to procure following the US entry into the war. In any case, RCN ocean escorts did not start receiving advanced radars until early 1943.

As late as June 1944, some Canadian escorts still had not received effective radars. Canadian corvettes supporting the Normandy landings were in many cases equipped with the finicky RX/C and SW2C. Even by the war's end the escorts from the first program were not fully equipped with Type 271 radars.

High Frequency Direction Finding

By the summer of 1941 all RN escort destroyers and many of the rescue ships were equipped with High Frequency Direction Finding (HF/DF) sets, allowing the triangulation and attack of U-boats.[19] In summer of 1942 the ships in Canadian escort groups still lacked HF/DF, and efforts were made to fit the escorts with sets. Apparently, however, NSHQ lacked understanding of the system, leading to a lack of urgency in fitting the escorts.[20] And so, Canadian escorts continued to operate without the important tactical information provided by HF/DF until the spring of 1943.[21] Creative efforts were made to make up for this deficiency, including using illumination shells to try to illuminate suspected U-boats. However, this tactic was dangerous for the convoy, and quickly fell out of use. Even with their inventive tactics, the lack of HF/DF in Canadian escort groups was a serious problem. As the December 1942 convoy ONS 154 learned when the convoy sailed without HF/DF, it could not pre-empt any attacks, only react. Combined with ineffective radar and disorganized command, the convoy lost one-third of its merchant ships and precipitated the withdrawal of Canadian escort groups from the Mid-Ocean Escort Force. Fortunately NSHQ realized the value of HF/DF, and by war's end all destroyers were fitted with it.[22]

Asdic and Anti-Submarine Warfare

In the early stages of the war – until the summer of 1942 – depth charges were the sole method of attacking a submerged submarine. Due to the need for the charges to

Credit: Royal Canadian Navy

*Acquired prewar, the C-class destroyer HMCS **Restigouche** (this ship and others acquired from the Royal Navy in this period were named **River**-class despite being different actual classes in material terms) eventually received a wide number of technical improvements. In this circa 1944 photo, a High-Frequency/Direction-Finding (HF/DF) antenna can be seen on top of the main (aft) mast.*

explode very close to the target – within 20 feet – depth charge attacks had a low rate of success.[23] Furthermore, the ship had to run directly over the submarine, losing asdic contact at a critical moment.

Due to a lack of high technology manufacturing, Canadian-built corvettes did not have the equipment needed to plot depth charge attacks accurately. Asdic was the means to detect and attack submerged submarines. The asdic sets were measuring instruments that sent out an acoustic pulse and then measured distances based on the time for the echo of the pulse to return – i.e., the predecessor of active sonar. Sound waves reflected off a submarine, and these waves were picked up by hydrophones, giving a range and bearing. Drawbacks of early systems were their limited range and inability to determine depth, meaning that depth settings for the depth charges had to be guessed.[24]

The asdic sets on Canadian corvettes were the obsolete Type 123A, which the RN considered inadequate for service on anything except auxiliaries.[25] In August of 1942, the decision was made to update to the latest Type 145, a system which could determine depth and was linked to forward-throwing weapons. Unfortunately, updating required a replacement of the entire electrical system, which began in early 1943.[26] The efforts to make the change were confused by NSHQ's decision to upgrade incrementally, first to the Type 127DV then to the Type 144Q/145, the best available. By the end of the war, few first program escorts were equipped with the latest asdic.

The ASW techniques evolved rapidly in the war – a deadly game of rapid action and reaction to offence and defence as the war progressed. In the summer of 1942 the RN began employing 'Hedgehog,' a system which allowed the firing of 24 small bombs forward of the ship, and in which asdic contact could be maintained throughout the attack.[27] The weapon was also gyro-stabilized, allowing accuracy in rough seas. Importantly, the bombs were contact fused, meaning only a direct hit would explode and misses would not obscure asdic conditions. These features gave the weapon a success rate of anywhere between two to six times better than depth charges.[28]

Unfortunately for the first and second Canadian build program escorts, the fact that the *Flower*-class had not been modernized made fitting Hedgehog difficult. The Type 123A or Type 123D asdic fitted to the corvettes was not capable of controlling the weapon, and the forecastle was too small.[29] Furthermore, NSHQ was unsure of Hedgehog's effectiveness, and the RN had trouble convincing escorts to use the weapon until early 1943.[30] The development of a forward-throwing anti-submarine mortar called 'Squid' also made NSHQ reluctant to fit Hedgehog, as it looked like an improvement was on the way. Unlike Hedgehog, Squid fired three large depth charges the depth of which was set by the Type 145 or 147B asdic.[31] Unfortunately, Squid was too heavy for the *Flower*-class, and was not fitted. However, RCN *Castle*- and *River*-class escorts featured these weapons.

Credit: Library and Archives Canada

R. Cosburn and Lieutenant F.A. Beck (right) monitor the asdic set on the bridge of HMCS ***Battleford****, a* ***Flower****-class corvette, in Sydney, Nova Scotia, November 1941.*

*Sailors load a Hedgehog anti-submarine mortar on the Increased Endurance **Flower**-class corvette HMCS **North Bay** in November 1943.*

In September 1943, the Kriegsmarine began employing the 'T-5' acoustic homing torpedo. Called the German Naval Acoustic Torpedo (GNAT) by the allies, it was acoustic homing with a magnetic firing pistol.[32] To counter this threat, towed noise-makers made of loose metal pipes inside a frame were developed. The metal pipes would rattle, creating noise to drown out the sound of the ship itself, attracting the torpedo away from the escort. The British developed 'Foxer' which was comprised of two sets of pipes. The RCN developed Canadian Anti-Acoustic Torpedo (CAT) gear, comprised of only one set. Easier to use, it was also more durable.[33] While not a perfect solution, when combined with tactical changes, the GNAT ended up being less of a threat than originally feared.[34] What is notable is that, unlike the otherwise slow adoption of technology, the RCN developed a decoy system very quickly. Not only did the RCN develop its own gear but it continued to employ it when confronted by the RN, which thought its system was better.[35] Unfortunately, both the systems had some faults – for example, the noise-maker was so loud that it would drown out the escort's own asdic so it had to be turned off during searches in order for asdic to work.[36]

Conclusion

The Battle of the Atlantic was the first real combat in which the Royal Canadian Navy participated. The difficulty in acquiring and building effective ASW equipment was a persistent problem in the RCN, reducing its effectiveness in defending convoys early in the war. Despite the difficulties the RCN had in securing and adopting modern equipment, it ultimately became a potent fighting force, destroying 33 U-boats during the course of the war.[37] That the RCN had this success while also having to contend with rapidly changing technology and a massive expansion of the fleet is remarkable. The growth from six destroyers to 278 warships strained Canadian industry, but it survived.[38] That the fleet did not uniformly have the most up-to-date technology caused problems during the war, but ultimately through cooperation with the RN and USN, the Battle of the Atlantic was won and that was a major factor in winning the war as a whole.

Notes

* This article is the opinion of the author, and not the opinion of the Royal Canadian Navy or the Department of National Defence.

1. James S. Pritchard, *A Bridge of Ships: Canadian Shipbuilding During the Second World War* (Montreal, QC: McGill-Queen's University Press, 2011), p. 293.
2. Roger Sarty, *Canada and the Battle of the Atlantic* (Montreal: Art Global, 1999), p. 119.
3. Pritchard. *A Bridge of Ships*, p. 229.
4. *Ibid*., p. 8.
5. Sarty, *Canada and the Battle of the Atlantic*, p. 140.
6. *Ibid*., p. 141.
7. Pritchard, *A Bridge of Ships*, p. 298.
8. Marc Milner, *The U-Boat Hunters: The Royal Canadian Navy and the Offensive against Germany's Submarines* (Toronto: University of Toronto Press, 1994), p. 88.
9. *Ibid*., p. 100.
10. *Ibid*., p. 16.
11. *Ibid*., p. 270.
12. Pritchard, *A Bridge of Ships*, p. 9.
13. Milner, *The U-Boat Hunters*, pp. 87-88.
14. Marc Milner, *North Atlantic Run: The Royal Canadian Navy and the Battle for the Convoys* (Annapolis, Maryland: Naval Institute Press, 1985), p. 219; Sarty, *Canada and the Battle of the Atlantic*, p. 135.
15. W.A.B. Douglas, et al., *A Blue Water Navy: The Official Operational History of the Royal Canadian Navy in the Second World War, 1943-1945*, Vol. II, Part 2 (Toronto: Dundurn Press, 2007), pp. 150, 223.
16. Milner. *North Atlantic Run*, p. 153.
17. Michael L. Hadley, *U-Boats Against Canada: German Submarines in Canadian Waters* (Montréal, QC: McGill-Queen's University Press, 1985), p. 31.
18. W.A.B. Douglas, et al., *No Higher Purpose: The Official Operational History of the Royal Canadian Navy in the Second World War, 1939-1943*, Vol. II, Part 1 (Toronto: Dundurn Press, 2004), p. 306.
19. Milner, *North Atlantic Run*, pp. 112-113.
20. *Ibid*., p. 123.
21. *Ibid*., p. 265.
22. Milner, *The U-Boat Hunters*, p. 15.
23. Hadley, *U-Boats Against Canada*, p. 12.
24. *Ibid*., pp. 11-12.
25. Milner, *North Atlantic Run*, pp. 34-37.
26. *Ibid*., p. 153; Douglas, et al., *A Blue Water Navy*, p. 73.
27. Hadley, *U-Boats Against Canada*, p. 204.
28. Milner, *The U-Boat Hunters*, p. 44.
29. Douglas, et al., *A Blue Water Navy*, p. 46.
30. Milner, *North Atlantic Run*, p. 266.
31. Milner, *The U-Boat Hunters*, p. 88.
32. *Ibid*., p. 62.
33. *Ibid*., pp. 72-73.
34. *Ibid*., p. 76.
35. *Ibid*., p. 75.
36. Hadley, *U-Boats Against Canada*, p. 204.
37. "The Battle of the Atlantic, 1939 to 1945," Canada.ca, 24 May 2018, available at www.canada.ca/en/navy/services/history/naval-service-1910-2010/battle-atlantic-1939-1945.html.
38. Rob Stuart, "Was the RCN Ever the Third Largest Navy?" *Canadian Naval Review*, Vol. 5, No. 3 (Fall 2009), p. 8.

Acting Sub-Lieutenant Liam Cole is a junior Naval Warfare Officer in the RCN. He graduated from the Royal Military College of Canada in 2018 with a BA in History, minoring in Business Administration.

Making Waves

Remembering Prime Minister Kim Campbell's Lonely, Losing Battle to Replace the Sea Kings

Robert Smol

I would like to make sure that Canada has the capability in the long run – not over four years but over forty years – to be able to patrol our fisheries and to be able to guard our coast. These helicopters, far from being Cadillac helicopters, are simply technology of the nineties. Right now, in the words of our own military, we have technology of the fifties built in the sixties. Kim Campbell on the need to replace the Sea Kings, 1993

In December 2018, what could safely be called the longest procurement delay in Canadian military history came to an end with the retirement of the Sea King maritime helicopter. Designed in the late 1950s and coming into operation in 1963, the helicopters were due to start being replaced in the mid-1990s by the EH-101 designed by Augusta Westland.

That was the plan until October 1993 when the Liberals under Jean Chretien defeated the Progressive Conservative government of Kim Campbell, who had recently replaced the retired, long-serving Prime Minister, Brian Mulroney. In the lead up to the election, Canada's first woman Prime Minister endured a barrage of attacks from the opposition parties and the public claiming that the new helicopters were 'Cadillacs' and were no longer needed in a post-Cold War world where, allegedly, the only suitable focus of the Canadian military was to be peacekeeping.

"Canadians do not want this program," insisted then Leader of the Official Opposition Jean Chretien to then Minister of National Defence Kim Campbell in the House on 25 February 1993.[1] "The minister, who I hope would like to have a new approach to politics, should realize that we are not in [the] cold war any more and we need the money for Canadian problems right away."[2]

In a political culture where prudence, planning and military procurement often fail to meet, the deck was stacked against those who thought the future might still require up-to-date maritime helicopters. At the time, much of the electorate was in agreement. Immediately following the Liberal Party victory in 1993, the EH-101 helicopter contract was cancelled with the Chretien government paying $158 million in cancellation fees to the contractor. This initiated a quarter-century legacy of what Aaron Plamondon in his book *The Politics of Procurement* described as the "worst procurement failure in Canadian history."[3]

Creating Opportunity, the Liberal's 1993 election manifesto (commonly referred to as the Red Book) placed the cancellation of the EH-101 Sea King replacement at the top of a list of measures aimed at bringing down expenditures "to achieve economic growth and job creation." Second on its list was "reduce national defence spending." Instead, the Liberals capitalized on the end of the Cold War to take Canada in a "New Direction" in foreign and defence policy that would "strengthen Canada's leadership role in international peacekeeping." This policy involved "a reorientation of Canadian defence policy and procurement practices to emphasize the key priority of peacekeeping."[4] This was to be achieved through the creation of a 'peacekeeping brigade' consisting of military and non-military personnel.

Credit: Simon Fraser University

As Minister of Defence and then as Prime Minister, Kim Campbell faced a barrage of criticism about the Conservative government's decision to purchase the EH-101 helicopters.

The Liberal's election manifesto was silent on Canada's role in NATO and NORAD but through its emphasis on peacekeeping, intended to foster "New Directions in Canadian-U.S Relations" that involved "rejecting a camp-follower approach in favour of pursuing a partnership with the United States."[5] For Jean Chretien and the Liberals this new approach meant that they intended to "cooperate with the US administration in areas where their ideas are particularly suited to our goals."[6] Among those goals were reform of the United Nations, strengthening international human rights and democracy, conversion of

the defence industry to producing non-military products and services, and protecting the global environment.

Helicopters Under Attack

"When I inherited the EH-101 file the big complaint was the expense of the item" said Kim Campbell in a recent interview. "The big complaint was that these [helicopters] were much too expensive, and that they were much more than we need. And my response was always tell me what specifications, in your mind are superfluous or surplus?"[7] When asked if the opposition put forth, at any time before or during the election, an alternative to the EH-101 purchase answer was "no, never."

Added to this was the obligation that, in stating the cost of the new purchase, the government had to include the projected costs of maintenance. As Campbell noted, "[t]he other thing is that when you have military procurement the Auditor General requires that the cost of a project of procurement must include all the costs associated with it including the cost of maintenance and the cost of training." Thus, "[i]t is very easy for an opposition party to take pot shots at a contract to procure, whether it is ships, aircraft or submarines because the numbers always seem very large."[8]

The Liberal attack on the helicopter procurement in the lead up to the election also focused on the number. At that point Canada, which intended to purchase 50 maritime tactical and search and rescue helicopters at $5.8 billion (including long-terms costs), was the largest single client of the EH-101. Speaking in the House of Commons on 8 March 1993 Brian Tobin, who was later to serve as Minister of Fisheries and Oceans in the Chretien government stated "why are we saying that we can afford this Cadillac extravagance in terms of a helicopter when there are cheaper alternatives and when the government of Italy, one-half of the consortium, has reduced the order from 36 to 16?"[9] This prompted a quick geography lesson by Campbell to the member from Newfoundland. "The fact of the matter is we buy this helicopter because it has specifications that are required for Canada. The last time I looked, Italy did not have the longest coastline in the world as we do. It does not have to conduct search and rescue operations in icing conditions and high wind conditions."[10]

Opposition to the contract was also brewing within Campbell's own caucus which was beginning to feel the pressure from the electorate. As a result, the Prime Minister agreed to reduce the size of the order from 50 to 35. According to Campbell, "[d]uring the election campaign

Credit: Sergeant Andrew Davis, 19 Wing Comox

Busy until the end: a CH-124 Sea King, painted in colours hearkening back to the beginning of Canada's maritime helicopter saga, operates in Smithers, British Columbia, on 31 August 2018 to support ***Operation Lentus*** *18-05.*

I was advised that it was becoming such a difficult issue and I think maybe some of our candidates were finding it hard to respond to this." She went on to say, "[p]eople play fast and lose with the facts and so as a compromise, which I incidentally disagreed with, we would order fewer of them."[11]

On 5 November 1993 one day after his new government was sworn in, Chretien cancelled the Sea King replacement project claiming, as reported in the *Toronto Star*, "the deal represents useless spending in today's context."[12]

In a recent interview with the author, David Collenette, who served as Minister of National Defence and Veterans Affairs in the Chretien government from 1993-96, mused about the alternative options that might have been taken by his government at the time. According to him, "[s]ome would say in retrospect that it might have been better to say look this is too rich for us and one other option would have been to say look you['ve] got six months EH-101 to come up with a better, more cost-effective price for the helicopters and, if not, then we will cancel. But that is all hindsight."[13]

Credit: MCpl Pat Blanchard, Canadian Forces Combat Camera

Based on the EH-101, the CH-149 Cormorant is Canada's primary search and rescue helicopter. Here, one hoists a search and rescue technician during the National Search and Rescue Exercise (SAREX 2016) in Yellowknife on 22 September 2016.

The EH-101 bogey was to come back and haunt the Chretien government when the need became clear for a search and rescue helicopter a few years later. "We had a rigorous contest for a replacement and, guess what, the EH-101 won the contest," said Collenette on the 1998 search and rescue only contract. "What the Prime Minister decided was that we would replace the search and rescue first because he felt the public would be willing to accept new helicopters in a very tight financial climate for search and rescue rather than maritime warfare."[14]

Unlike Mulroney/Campbell's EH-101 search and rescue craft, Chretien's re-procured and re-designated EH-101 (CH-149 Cormorant) was to be built entirely in Europe. "I think it is shameful," says Campbell reflecting on the decision to go ahead with the search and rescue version of the EH-101 after cancelling the contract and paying the cancellation penalty. "They were just playing politics and I think that's really very unfortunate. I think that creating cynicism about government is a very dangerous thing."[15]

The operational war-fighting side of Canada's helicopter fleet would have to wait another 20 years, six elections, three Prime Ministers and nine Defence Ministers before finally beginning to come online. Meanwhile the United Kingdom, Italy, Norway, Denmark, Japan and Portugal completed their acquisition of the EH-101 in the early 2000s. Other countries, such as Algeria and Indonesia, also beat Canada to the maritime procurement modernization punch with the EH-101.

"It leaves a lot of questions," says Collenette. "I have watched the procurement process under [the] Stephen Harper government and now under Justin Trudeau's government and it just seems that we just don't get our military procurement process right. Whether it is Conservative or Liberal governments, it is just difficult to take the decision because you upset one part of the country, one part of the electorate, and we are always into an electoral cycle."[16]

Credit: Casper Tybjerg, Danish Defence (Forsvaret)

Students from the Danish Frogmen Corps Student School jump out of a Royal Danish Air Force EH-101 for the first time as part of their training at Marinestation Kongsøre in 2015.

The decision-makers involved in the EH-101 decisions may no longer be in public life and are free to reflect on and revise the intentions behind their decisions as they please. However for an entire generation of senior RCN and RCAF officers and NCOs tasked to keep the Sea Kings in a state of readiness, the politics surrounding the cancellation of the EH-101 is a legacy that is only now beginning to recede.

Notes

1. Jean Chretien, House of Commons Debates, Official Report, Third Session, 34th Parliament, 42 Elizabeth II, Vol XV, 1993, available at http://parl.canadiana.ca/view/oop.debates_HOC3403.
2. *Ibid.*
3. Aaron Plamondon, *The Politics of Procurement: Military Acquisition in Canada and the Sea King Helicopters* (Vancouver: UBC Press, 2010).
4. Liberal Party of Canada, "Creating Opportunity," 1993, available at www.poltext.org/sites/poltext.org/files/plateformes/can1993lib_plt_en_12072011_131100.pdf. The quotes were taken from Chapter 8, pp. 106-08.
5. *Ibid.*
6. *Ibid.*

7. Interview with Kim Campbell, 21 November 2018.
8. *Ibid*.
9. Brian Tobin, House of Commons Debates, Official Report, Third Session, 34th Parliament, 42 Elizabeth II, Vol XV, 1993, 8 March 1993, available at http://parl.canadiana.ca/view/oop.debates_HOC3403
10. Kim Campbell, House of Commons Debates, Official Report, Third Session, 34th Parliament, 42 Elizabeth II, Vol XV, 1993, 8 March 1993, available at http://parl.canadiana.ca/view/oop.debates_HOC3403.
11. Interview with Kim Campbell 21 November 2018.
12. Tim Harper and Patrick Doyle, "Chretien Chops Copters as Cabinet Gets a Flying Start," *Toronto Star*, 5 November 1993, p. 1.
13. Interview with David Collenette, 8 November 2018.
14. *Ibid*.
15. Interview with Kim Campbell, 21 November 2018.
16. Interview with David Collenette, 8 November 2018.

Are We Losing the North? Canadian Arctic Security and Sovereignty

David Dunlop[1]

Due to its increasing accessibility resulting from climate change, the Arctic may become a contested and militarized arena where states within the region and beyond attempt to secure access to lucrative shipping routes and resources. Such an eventuality poses particular challenges to Canada, raising the spectre that Canadian sovereignty in the North could be irrevocably compromised. Canada's legal title to its Arctic territories is well established, however given the increased interest and anticipated activity in the Arctic, Canada will need to increase its presence in the region. Along with an enhanced presence, it is also imperative that Canada has the ability to survey, and be aware, of what transpires on, underneath and above its Arctic domain.

Over the years the United States has questioned Canada's claims to the Northwest Passage. This was illustrated by the voyage of *Polar Sea*, a US Coast Guard icebreaker, that transited the Northwest Passage in 1985. The United States made a point of not requesting permission from Canada to transit these waters, thus upholding the American position that the passage constitutes an international strait.

But it is not the United States that is the biggest concern for Canada in the Arctic. Russia occupies over 50 per cent of the land-mass bordering on the Arctic Ocean and it regards that part of its territory as having a special strategic importance. Despite the interests that should be shared by Canada and Russia, which together occupy more than four-fifths of the Arctic land mass, it has taken a long time to work out mutually acceptable arrangements. However Russian actions in the Ukraine, and its increased capability and activity in the Arctic have been read as a sign of aggressive and threatening behaviour in a conflictual geopolitical situation.

Some Canadians have growing concern about the security of Canada's Arctic territories that are being affected by aggressive new Russian developments. Recent Russian submarine fleet excursions into both the Arctic and North Atlantic, and increased Russian activities in the air and at sea, have also given the NATO alliance concern about the security of the region. NATO aspires to have control of the North Atlantic and Arctic by establishing a new Joint Force Command with Canada as a major player in this organization.

Credit: US Coast Guard

The US Coast Guard icebreaker ***Polar Sea*** *is seen here during an international research expedition in the Beaufort Sea on 20 November 2009.*

Credit: Military Sealift Command

A pair of Russian icebreakers leads the cargo ship MV ***American Tern*** *through ice-covered waters on 31 January 2006.*

The recent flurry of Russian military projects in the Arctic, including icebreaker construction and the re-activation of air and army bases on their northern islands is, in part, aimed at establishing unquestioned control of the Northern Sea Route, and perhaps indicating the Russian belief that the Arctic Archipelago waters constitute an international strait. This is not to suggest that developing a war-fighting capacity in the Arctic is an objective of Russia. However, domestic political calculations and constabulary requirements have heavily shaped the makeup and operational nature of military developments thus far in the region. Some military developments in the Arctic, furthermore, are based on larger, extra-regional factors. Modernization of the Russian Northern Fleet, for instance, is designed to upgrade Russia's nuclear submarine deterrent and for global operations. Similarly, the US ground-based interceptors in Alaska are meant to counter a missile attack from a rogue state, specifically North Korea.

While sea ice has historically prevented a naval surface threat to the Canadian Arctic, new technologies are causing a sub-surface threat posed by Russian submarines to develop rapidly. One-half of the Russian submarine fleet is based in Murmansk, and Russian submarine-launched ballistic missiles (SLBM) are now deployed in Russia's Arctic basin. If Canada wanted to take action to deal with this rising submarine threat, it would have to call on USN submarines.

The waters of the Canadian Arctic now offer a free transit route for Russian submarines to pass from the Arctic Ocean into the Atlantic Ocean and channels where they could intercept NATO submarines. Canada still lacks the capability to monitor the vast sub-surface area of the Arctic. Canada must be able to determine what is happening under the ice in the Canadian Arctic Archipelago, and to deter hostile or potentially hostile intrusions. The *Victoria*-class submarines Canada possesses just do not have the under-ice endurance to accomplish this task. It is time for Canada to consider more capable submarines, that can safely travel under the ice in the Arctic. Nuclear-powered submarines (SSNs) are uniquely capable anti-submarine platforms, well-suited to do exactly that. Through their mere presence, nuclear-powered submarines can deny an opponent the use of sea areas. They are the only proven vehicle today or for the foreseeable future, capable of sustained operation under the ice, and would complement aerial reconnaissance, the Arctic Off-shore Patrol Ships (AOPS) and Canadian Surface Combatant (CSC) frigates in a vivid demonstration of Canadian determination to meet challenges in all three of its oceans.

The capacity to defend Canada's sovereignty should be at the heart of the government's efforts to rebuild the Canadian Forces. It should reinvest in military capabilities with a strong stance on sovereignty and send a clear message to the world: Canada is back as a credible player on the international stage. Defending sovereignty in the North also demands that Canada has the capacity to act. The new AOPS, CSC frigates along with an expanded aerial/satellite surveillance will help guard Canada's Far North and the Northwest Passage. As well, the size and capabilities of the Arctic Rangers must be expanded so they can better patrol the vast Arctic territory.

In Canada's defence policy – *Strong, Secure, Engaged* – the government placed focus on Arctic sovereignty. In order to address some of the issues arising in the North, the policy stresses coordinating information from drones, submarines, local people and satellites to get the fullest possible picture of the area. To this end, the policy plans to expand training for the Canadian Rangers to improve their ability to support the Canadian Armed Forces. Canada's Defence Minister, Harjit S. Sajjan has said that "[a]s an Arctic nation, Canada's presence and ability to operate in the North is key to meeting current and future security and defence needs. Through our defence policy we are ensuring Canadian Armed Forces members have the facilities they need to effectively work and train as they serve alongside our most remote communities well into the future."[2]

However, the Russia-related alarms raised by officials,

analysts and Parliamentarians through Senate and House of Commons reports have not been carried over into the government's new defence policy. *Strong, Secure, Engaged* notes a NATO concern that Russia is expanding its capacity to project force from the Arctic into the North Atlantic. The statement does not treat Russia as benign. It points to the "illegal annexation of Crimea," notes Russia's "willingness to test the international security environment," and acknowledges the return of "a degree of major power competition … to the international system."[3] But concern about Russia's actions in the North has not made a significant appearance in the policy.

Conclusions

The Arctic is increasingly significant to the long-term interests of all Canadians: economic, political, social and environmental. This huge part of Canadian territory is no longer out of the limelight in the way it was decades ago. As a result, Canadians are having to reconsider the possible effects of foreign missile attacks on this country, with renewed attention to proposals for counter-measures in the form of new defensive systems, and generally re-think strategic developments in the Arctic. The increasing strategic importance of the North, and the need for Canada to exercise effective control over its Arctic lands, air space and waters will result in a greater military presence in that area. This will mean increased security for all Canadians and substantial economic benefits for northerners.

In order to enhance the sovereignty and security of our Arctic archipelago, Canada must step up to the plate, and produce a more cohesive Arctic Defence Policy with a much greater Canadian presence. It should focus on these four overarching objectives:

- Enhance the security and prosperity of northern Canadians, especially Aboriginal peoples;
- Assert and ensure the preservation of Canada's security and sovereignty in the Arctic region by substantially increasing surface, sub-surface and aerial presence in the Arctic region with the procurement of a credible modern submarine fleet (either non-nuclear-powered ice-capable submarines, or nuclear-powered submarines), better aerial surveillance (including the procurement of High Altitude Long Endurance (HALE) drones), better satellite surveillance and a strategic sealift capability;
- Establish the Circumpolar region as a vibrant geopolitical entity integrated into a rules-based international system; and
- Promote the human security of northerners and the sustainable development of the Arctic.

There is no denying fiscal constraints on defence, but there is also no denying that Canada's current submarine capability does not allow Canada to protect its sovereignty under the sea in the North. Russia will continue to utilize the Arctic Ocean for its purposes, as will the United States – and now China is working to become a player in the Arctic. Now is the time to begin the process of replacing the *Victoria*-class with a modern, credible, nuclear-powered submarine that is capable of operating under ice in the Arctic Ocean. However, to accomplish this under current fiscal constraints would be difficult at best. The *Victoria*-class fleet will have to be utilized for several years longer, past 2030 – well beyond its shelf-life – before modern submarines can be secured, unless there is an increase in defence spending very soon.

The Arctic is fundamental to Canada's national identity. Canada must exercise its sovereignty over the North, as well as the rest of Canada. In order to be able to deal effectively with emerging challenges, it is important that Canada has in place the capabilities to operate in the Arctic, and an integrated Arctic strategy with a clear decision structure that includes the participation of relevant stakeholders, especially those who have long inhabited the region.

***Victoria**-class submarine HMCS **Windsor** sails off the Nova Scotia coast on 18 September 2016 during Exercise Cutlass Fury.*

Notes

1. This article expresses the opinion of the author and not the opinion of *Canadian Naval Review* (CNR).
2. Department of National Defence, "News Release: Defence Minister Wraps-up Trip to Canada's Arctic," 16 August 2018.
3. The Simons Foundation, "Arctic Security and the Canadian Defence Policy Statement," 31 August 2017, p. 3.

Response to "Understanding the Delusion"

Commander RCN (Ret'd) Robert A. Rutherford, CD

The following is a response to Robert Smol's article, "Understanding the Delusion and the Reality behind Canada's Arctic Offshore Patrol Ships," in the Making Waves section of the Fall 2018 issue of *Canadian Naval Review* (Vol. 14, No. 2). I find myself wondering what Mr. Smol's objective was in writing this piece. In my opinion, a response is in order.

I have several quibbles. First, Smol goes on about Canada's disputed Arctic waters, but does not define the dispute. Second, he seems to discount the AOPS and its design features, whereas elsewhere much has been written giving the rationale for the ships and how they will be employed.[1] Third, he decries the high cost of these ships without any acknowledgement that there is a premium to be paid for maintaining shipbuilding capacity in Canada. The point that he misses is that in the end, we will have a class of patrol ships that are much bigger and more ice-capable than the 'war-capable Danish.'

The multi-dimensional threat about which he seems so concerned is simply not there, so why spend a great deal of money to counter it. Should that threat ever become real, the AOPSs can be equipped to address it. The ships are more than three times the size of the Danish *Knud Rasmussen*-class patrol ships (6,440 tonnes versus 2,050 tonnes). Furthermore, the weapon suite in the Danish ships is largely 'fitted for but not with.' In fact, a side-by-side comparison of the two ship designs will show that the Canadian design is much superior in every respect other than the calibre of the main gun system.

There are several more points to note:

- We are not at war and there is no immediate military threat in the Canadian Arctic area. The concern is to monitor and oversee the increasing use of the Arctic by commercial shipping. Innocent passage through the Canadian Arctic does not have to be met by patrol ships armed to the teeth.
- The ship is designed to Polar Class 5, which can deal with first-year ice up to one metre thick. That is quite enough to keep it out of difficulty it might encounter during the Arctic navigation season (nominally from July to October). Thereafter the ships will be tasked with offshore patrols, and hence the dual name.
- When the navy says that the *DeWolf*-class ships are not icebreakers, I take that to mean that the ships will not be *employed* as icebreakers. That is to say, they will not break ice to maintain shipping routes, and they will not escort shipping through ice-infested waters. Those functions belong to the Canadian Coast Guard.
- The 25mm gun is quite adequate to reinforce sovereignty. The ship is capable of carrying a larger calibre gun should the threat level warrant it. Machine guns of 12.7mm (.50 cal) are so prevalent in ships nowadays they hardly deserve mention. Bigger is not always better when comparing gun systems. Best is the enemy of good enough.
- Surface-to-air missile systems require considerable weight and space for threat detection and missile guidance. The addition of this capability would require extensive reconfiguration of the ship. More likely, an air threat would be met by installing an autonomous gun-based close-in-weapon system such as Phalanx.
- Anti-submarine warfare torpedoes are not much use without sonar to detect submarines, and hull-mounted sonars are not compatible with an icebreaking hull. The CH-148 Cyclone helicopter, which the ship is capable of carrying, has the capability to conduct anti-submarine operations, should the need arise. A towed sonar system can be fitted into a container and carried on the stern of the ship.
- It is not surprising that patrol ships in European navies are well armed. For example, Norway shares a maritime border with Russia. Denmark provides NATO's control of access to and from the Baltic. Canada's neighbours in the Arctic, Greenland (Denmark) in the east and Alaska (USA) in the west, are both friendly allies.

*The future HMCS **Harry DeWolf** was named at a ceremony on 5 October 2018 in Halifax. Two 'megablocks' of sister ship **Margaret Brooke** can be seen joined on land near **Harry DeWolf**.*

Notes

1. On this topic, I highly recommend the following article. Adam Lajeunesse, "Unarmed Warships: What are the AOPS for?" Canadian Global Affairs Institute, June 2018.

Dollars and Sense:

Canada is Making Real Procurement Progress, but Still Falling Short of *Strong, Secure, Engaged*

Dave Perry

On 19 October 2018, the Canadian Surface Combatant (CSC) project, National Shipbuilding Strategy and Canadian defence procurement in general made a major step forward with the identification of Lockheed Martin Canada as the preferred bidder in the competition to select a ship design. By the time this issue goes to print, contracts will likely have been signed with Lockheed for the design and development of the CSC and with Irving Shipbuilding to build the ships. Negotiations were still underway at the time of writing and one of the other bidders has filed a challenge with the Canadian International Trade Tribunal and the Federal Court, but Canada's surface ship replacement will likely take a step forward early in 2019 by signing contracts to start work on Lockheed's Type 26-based bid. Much work remains on the project, of course, but this is a major move forward for the naval recapitalization program, and a positive milestone for Canadian defence procurement overall.

The CSC milestone is a public example of what has been a quietly positive trend in Canada's defence procurement. The financial reports of the Department of National Defence (DND) to Parliament in the fall of 2018 show that the government of Justin Trudeau continues to fall well short of its procurement plans but there have been encouraging developments in the overall trajectory of the procurement program. Spending money on capital procurement isn't the only, or necessarily the best, measure of how effectively the Trudeau government is implementing the procurement aspects of its defence policy, but it provides the easiest way of comprehensively evaluating its process on procurement and one that allows a comparison with past governments. While operational employability of fully capable new equipment is the ultimate test of defence procurement, the government needs to buy the equipment before that can be accomplished.

The Public Accounts of Canada for fiscal year 2017-2018 show a meaningful increase in DND's procurement spending in the first year of the Trudeau government's *Strong, Secure, Engaged* defence policy. In the first year under the policy, DND spent $3.7 billion on capital. In real dollars, that is the most Canada has spent on military equipment and infrastructure procurement since 2010-2011, the year that set the high-water mark for Canadian defence procurement spending since the 1980s. The Supplementary Estimates A for 2018-2019 show that in the fiscal year ending 31 March 2019 that level of spending might rise yet again. As of that document's publication, DND's capital allocation for the year stands at $4.1 billion, roughly $200 million more than at the same point in the previous fiscal year. While the money for 2018-2019 has yet to be spent, it is a good sign that Canada's procurement spending will increase for the second year in a row.

This is especially the case because the same Public Accounts for 2017-2018 referred to earlier show that DND has finally started to spend the capital procurement money it has been allocated. Historically, DND spent virtually all of the money it was allocated each year for capital. Through 2006-2007, on average 98% of the allocated funds were actually spent each year. Starting in 2007-2008, however, DND started leaving hundreds of millions of dollars worth of procurement funds unspent at year's end. This underspending, which took several forms, is referred to generically in the Public Accounts as a 'lapse.' This lapsed funding denoted funding that was requested and made available to DND for capital purchases but that went unused in the year intended.

In 2017-2018 only $160 million, or 4% of DND's capital funding allocation, was allowed to lapse by DND. As a percentage, that was the smallest capital lapse since 2006-2007. So at least for one year, things have returned to normal. DND actually spent most of its procurement money; hopefully the same will occur this year.

Lockheed Martin and BAE Systems' Type 26 entry for the Canadian Surface Combatant competition was selected as the preferred bidder on 19 October 2018.

Detail by Organization — Department of National Defence

Department of National Defence

Organization Summary

		Authorities To Date	These Supplementary Estimates: Transfers	These Supplementary Estimates: Adjustments	Proposed Authorities To Date
			(dollars)		
Budgetary					
Voted					
1a	Operating expenditures	15,630,416,828	(50,665,361)	56,276,610	15,636,028,077
5a	Capital expenditures	3,761,023,833	(11,381,536)	313,034,460	4,062,676,757
10a	Grants and contributions	176,719,317	(11,000,000)	24,183,114	189,902,431
15a	Debt write-off	.....	15,380	1	15,381
20a	Debt forgiveness	.....	173	1	174
Total Voted		**19,568,159,978**	**(73,031,344)**	**393,494,186**	**19,888,622,820**
Total Statutory		1,202,283,005	(163,853)	.....	1,202,119,152
Total Budgetary Expenditures		**20,770,442,983**	**(73,195,197)**	**393,494,186**	**21,090,741,972**

Note: Additional details by organization are available on the Treasury Board Secretariat website – http://www.canada.ca/en/treasury-board-secretariat.html.

Credit: Treasury Board of Canada

A summary of Department of National Defence expenditures from the 2018-2019 Supplementary Estimates (A) indicates Capital Expenditures will increase from approximately $3.8 billion to $4.1 billion for the 2018-2019 fiscal year.

Despite these positive trends, DND is still falling well short of meeting the procurement spending targets laid out in *Strong, Secure, Engaged*. In 2017-2018 actual capital spending fell $2.5 billion short of the projection laid out in the policy. The Supplementary Estimates are painting a similar picture for 2018-2019, showing that DND is on a trajectory of falling short by a comparable amount once again. The fiscal year is not finished, however, and DND's Deputy Minister has stated publicly that she is hoping to see the amount that goes unspent drop below $1 billion.

Achieving the Deputy Minister's spending target will be extraordinarily difficult, as Canada's defence procurement system is still trying to ramp up to spend money at a higher rate than it has in decades. The largest chunk of that money is earmarked for the CSC project. The next largest is for the future fighter jet project, which released a draft Request for Proposal (RFP) for pre-qualified bidders in the fall. The stated plan for that project is to have an actual RFP released in the spring of 2019. After years of inaction, Canada is trying to make up for lost time and is rushing to get on with the purchase, and the viability of the current timetable depends on the feedback provided by bidders to the government of Canada just prior to Christmas.

Credit: Cpl Dominic Duchesne-Beaulieu

The Request for Proposals for CF-18 Hornet replacements is expected to be released by the spring of 2019. Here, a Hornet is pictured after a flight at a Romanian airbase during ***Operation Reassurance*** *on 29 November 2018.*

These two major projects aside, the bulk of DND's capital money is distributed across dozens of other projects. Spending it is therefore not reliant on any single project but rather moving many of them, simultaneously, while also buying new ships and fighters – no easy task. Additional procurement improvements therefore are still needed to reach the spending targets outlined in *Strong, Secure, Engaged*. At this point, it is clear that the Trudeau government is not contemplating any big changes to procurement such as a major hiring spree or institutional reorganization to create a long-discussed single Canadian defence procurement agency.

However, a number of a small improvements have been made, and more may be on the way. DND has continued to hire additional procurement staff and train those it already employs. Internally, there have already been reorganizations to put a two-star General and Rear-Admiral in charge of the air force's fighter jet and navy's shipbuilding projects respectively, and DND's defence procurement process manual is being revised.

The Minister of Public Services and Procurement Canada (PSPC) also indicated that additional help is on the way as the government is moving to a risk-based contracting approval model for defence procurement. Such a shift will not be flashy as it represents an incredibly technocratic change to one part of Canada's cumbersome approvals process which previously required PSPC to obtain Treasury Board approval for most major contracts through a process which took multiple months. The new process will delegate this approval authority to PSPC for lower risk contracts, saving months on each contract, while also allowing attention to be focused on reviewing the contracts that most need the review.

As the selection of the CSC preferred bidder indicated, and DND's spending data confirm, progress on procurement is being made, although not as much as envisioned in Canada's defence policy. Searching for more small, unsexy, but meaningful changes to the procurement process is probably the most realistic way of ensuring that as much of that targeted spending is actually spent as possible.

Dave Perry is Vice President and Senior Analyst at the Canadian Global Affairs Institute.

Warship Developments:
Snippets

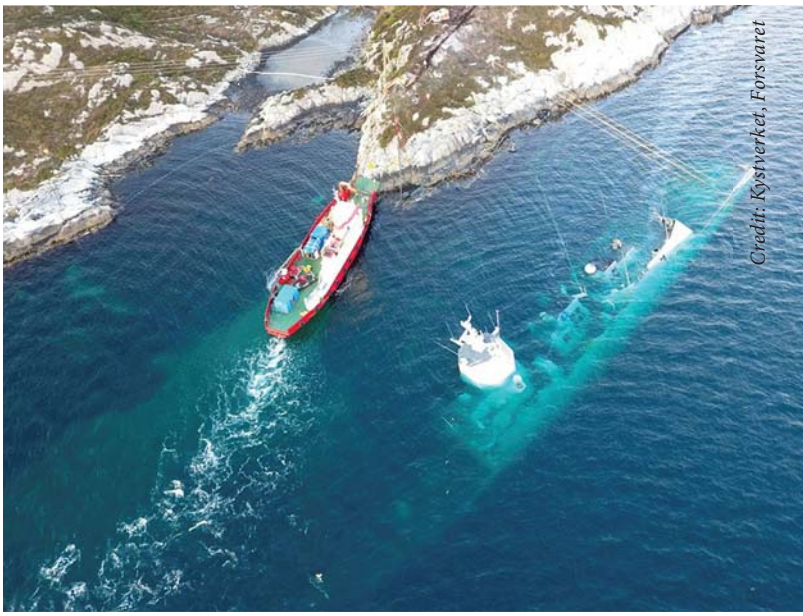
Doug Thomas

Misadventure at Sea!

2017-2018 was notable for a number of incidents in which warships from first-world navies collided with merchant or fishing vessels, with consequent deaths, injuries, and hundreds of millions of dollars expended to repair the vessels. I am thinking here specifically of two US Navy guided-missile destroyers (DDGs) in Pacific waters during 2017, and the recent collision and possible constructive loss of the Norwegian frigate KNM *Helge Ingstad* (F313) (one of three Norwegian frigates on the cover of the fall issue of *CNR* (Volume 14, Number 2)). The reports on the incidents involving the destroyers USS *Fitzgerald* and USS *John S. McCain* state that both collisions were avoidable and caused by lack of adherence to sound navigational practices and well-established procedures and, in the case of *Fitzgerald*, a lack of knowledge about how to operate the ship's bridge control console during a steering failure! There have been suggestions of a lack of basic training due to the need for a high operational tempo. One would think that high operational tempo would lead to very experienced watch-standers, but clearly there are serious issues requiring resolution. Several senior USN Admirals, as well as key members of the command teams in the ships involved, were relieved of their positions and charges were preferred against a number of ship's officers. Issues of training, sleep deprivation and expired readiness assessments are being addressed as priorities.

The collision and possible loss of the modern *Helge Ingstad* in home waters must be very troubling to the small but professional Norwegian Navy. The preliminary report of the Accident Investigation Board indicates a number of factors played a role in the collision between a frigate returning at night in clear conditions from operations at sea with NATO's Standing Naval Group One, and a tanker leaving a terminal.[1] The factors include: the frigate's bridge watch had just changed a short time before the 0401 collision; they did not appreciate that the 122,000 ton tanker *Sola TS* had departed the terminal where it had been alongside; the bright background lighting at the terminal and upper deck working lights on the tanker made it very difficult to see the ship's navigation lights; and the vessel traffic system which controlled the movement of shipping in that area appears to have contributed to this confusion – perhaps they should have delayed *Sola TS* moving from the terminal until the frigate was past and clear?

Additionally, there are concerns that the watertight integrity of the ship was inadequate and contributed to its sinking. *Helge Ingstad* is one of five ships of this class, built by Spanish shipbuilder Navantia, so the report recommended that the shipbuilder determine whether there were issues with the design of the other four. *Helge Ingstad* sank to the bottom of the fjord with only her upper works visible. It is understood that the frigate will be raised and towed to the base at Haakonsvern to see whether the ship can be repaired.



*A photo taken by a Norwegian Coastal Administration drone shows KNM **Helge Ingstad** submerged on 28 November 2018, after a collision with the tanker TS **Sola**. Heavy weather has posed a challenge to the ship's salvage.*

Success of MV Asterix as an Interim AOR

MV *Asterix*, a container ship converted for naval replenishment duties by Davie Shipbuilding and leased to the Department of National Defence (DND), is now performing well as the Canadian Navy's interim (and only) operational support ship. With her combined crew of civilians to operate the ship, and naval and air personnel to perform duties such as underway replenishment of warships and operating and maintaining maritime helicopters, she did a terrific job in supporting fleet and allied operations in the Pacific for most of 2018. As readers of *CNR* know, the Joint Support Ships meant to replace the last two naval support ships (which are now in the process of being scrapped) have been delayed and are not likely to be in service until about 2023, the end of *Asterix*'s current five-year contract. One hopes that *Asterix*'s contract is renewed or, even better, that she is purchased outright and commissioned into the RCN as a back-up vessel to the two new-construction Joint Support Ships, HMC Ships *Preserver* and *Protecteur*. The name HMCS *Provider* – the name of the first true AOR (a Canadian one-stop-shopping innovation, by the way) – would be a great choice if/when *Asterix* is commissioned!


Credit: Davie Shipbuilding

*CCGS **Molly Kool** was relaunched at Davie Shipbuilding on 13 November 2018 after an abbreviated conversion from its former life as the Swedish Baltic Sea icebreaker **Vidar Viking**. While **Molly Kool** begins service this season, two sister-ships will undergo a more comprehensive refit, such as a helicopter deck and hangar, that **Molly Kool** will receive later.*

Re-purposing ships procured from abroad is proving to be a popular move in Canada right now: three commercial icebreakers have been purchased from a Swedish firm, Viking Supply Ships AS, and are being refitted and modified by Davie Shipbuilding for service with the Canadian Coast Guard as medium icebreakers. Other national fleets, such as the UK and Australia, have benefitted from such opportunities – sometimes used ships are better than no ships!

Australia and Canada Announce British Type 26 Frigate as Their New Surface Combatant

After Canada and Australia announced that the Type 26 frigate was the design they had selected for the recapitalization of their fleets, this raised the total numbers of Type 26 frigates to 32 units: eight British, nine to Australia and 15 to Canada, with the Australian and Canadian ships to be constructed in national shipyards. The selection of the bid of the Lockheed Martin group of companies has been challenged by Alion Canada, which brought a halt to the process. But the Canadian International Trade Tribunal rescinded its order to Public Services and Procurement Canada (PSPC) to postpone the award of contracts pursuant to Alion Canada's complaint.[2]

The names for the RN Type 26 (*City*-class) have been announced as HM Ships *Glasgow, Belfast, Cardiff, Birmingham, London, Newcastle, Edinburgh* and *Sheffield*. All of these names have long histories in the Royal Navy: HMS *London* has had 10 predecessors, dating back to 1657! The Royal Australian Navy Type 26s will be the *Hunter*-class, named after famous antipodean explorers.

Short Take-Off Vertical Landing Operations

The Royal Navy's newly built HMS *Queen Elizabeth* has recently conducted extensive first-of-class trials off the US East Coast with the F-35B short take-off vertical landing (STOVL) variant of the Joint Strike Fighter. The USN will also operate the F-35B from its large-deck vessels to provide air support to amphibious operations.

China has continued building up islets and reefs in the Spratly and Paracel Islands in the South China Sea and claiming them (together with the South China Sea) as sovereign territory, despite conflicting claims of other states. These specks on nautical charts were often awash at high tide in the past, but some of them now sport harbours, jetties and air strips. Furthermore, they are being used as bases and unsinkable 'stationary aircraft carriers.'

Japan is reviewing its defence plans and the prohibition of robust military action included in its constitution, and is considering turning its *Izumo*-class helicopter destroyers into multi-purpose aircraft carriers. These ships are 248 metres long and displace 28,000 tons, so there would be space to accommodate a number of F-35B STOVL jet fighters. Japan already operates the F-35A and is preparing to procure another 100 – which could include F-35Bs. China's naval expansion, and especially its ambitious aircraft carrier program, is motivating regional navies to strengthen their capability to counter Chinese saber-rattling.


Credit: US Navy courtesy of the Royal Navy

*An F-35B lands aboard the Royal Navy aircraft carrier HMS **Queen Elizabeth** as part of the ship's trials on 17 November 2018 in the North Atlantic.*

Notes

1. Accident Investigation Board Norway, "Preliminary Marine Accident Report – Collision between the Frigate 'KNM Helge Ingstad' and the Oil Tanker 'Sola TS' on 8 November 2018, Outside the Sture Terminal in Hjeltefjorden in Hordaland County," issued 29 November 2018.
2. See Andrea Gunn, "Warship Contract Pause Lifted," *Chronicle-Herald*, 11 December 2018.

Book Reviews

Protecting the Ability to Trade in the Indian Ocean Maritime Economy, edited by Andrew Forbes, Canberra, Australia: Sea Power Centre - Australia, Sea Power Series, No. 3, Commonwealth of Australia, 2014, 137 pages, ISBN 978-0-99250-046-7

Reviewed by Colonel (Ret'd) Brian K. Wentzell

Andrew Forbes has compiled the proceedings of the Indian Ocean Naval Symposium 2014 which dealt with the maritime economic aspects of that region of the world. The symposium was held under the auspices of the Royal Australian Navy in Perth, Western Australia, in June of that year. The host and Chair of the event was Vice-Admiral R. J. Griggs, then Chief of the Royal Australian Navy. It was attended by various naval, academic, government and industry representatives from Indian Ocean rim states.

While we, as residents of North America, tend to think of the Indian Ocean in terms of its northern reaches – that is, from the Red Sea, to the entrance to the Persian Gulf and onward past Pakistan and India to the Malacca Straits and vice versa – there are 36 countries and several remnants of colonial France and the United Kingdom that depend on its waters for food, transportation and security. Each of the 13 presenters addressed the symposium on various aspects of these subject areas; however, security of the use of the ocean was the dominant theme. Without adequate political, economic and physical security systems, the exploitation of fish stocks, the extraction of petroleum and minerals, the interdiction of illegal trading or smuggling of drugs, weapons and migrants, the undertaking of humanitarian assistance/disaster relief operations, and prevention of inter-state aggression would be very difficult. The paucity of national resources makes progress on any of these issues a challenge.

The concept of a 'navy' in the Indian Ocean is also vague. Obviously, Australia, India, Pakistan and South Africa have navies in the traditional sense. However, in many of the Indian Ocean rim states the 'navies' may be the local coast guard or marine police. The real issue is not the name of the force or the size of its vessels but rather its ability to enforce laws designed to protect the natural resources and the laws of the country as far as the limits of its exclusive economic zone and territorial waters. In many countries there is little capability for such tasks.

The symposia are intended to occur bi-annually under the auspices of the Chairperson. It remains to be seen if positive action comes out of the efforts of participants. However, the importance of discussion of the issues cannot be understated. This book is a valuable resource for those interested in the state of affairs in the Indian Ocean.

Letters from Beauly: Pat Hennessy and the Canadian Forestry Corps in Scotland, 1940-1945, by Melynda Jarratt, New Brunswick Military Heritage Series, Volume 23, New Brunswick, Canada: Goose Lane Editions and The Gregg Centre for the Study of War and Society, 2016, 192 pages, CA $18.95, ISBN 978-0-86492-893-1 (paperback)

Reviewed by Katelyn O'Neill

Letters from Beauly depicts the wartime history of one man, Pat Hennessy, his family, his fellow members of the Canadian Forestry Corps (CFC) and his community of Bathurst, New Brunswick. Pat Hennessy served as a cook for 15 Company of the CFC, which had logging operations in northern Scotland during the Second World War. The book tells Hennessy's experiences travelling to Scotland and his experience there during the war through correspondence between him and his family during the war.

Author Melynda Jarratt, granddaughter to Pat Hennessy, does her grandfather's legacy justice while chronicling his years serving in Scotland. When Jarratt came across over 300 wartime letters in her family's attic she was inspired to tell the story of her grandfather's life during the war, and with that the wider experience of her family during this time. Jarratt is a well-versed author in Canadian history in the Second World War and utilizes this knowledge to share Hennessy's experience, a story so personal to her and her family. What makes this book intriguing is the detail that Jarratt includes throughout, as she delivers a context to the letters. For example, she describes various individuals that came into contact with Hennessy during his experience in Scotland, such as Fred Cogswell, who went on to become one of Canada's notable poets.

The book begins by offering background on who Pat Hennessy and his family were, giving a full family history and description of Hennessy's life. In 1940 Hennessy decided to join the army despite his age of 56, which was 11 years past the age limit – the CFC turned out to be not overly strict with its age requirement. The book then follows Hennessy through his basic training at Camp Valcartier until he embarked for Scotland on 7 April 1941. In his letters Hennessy tells his loved ones of his hardships at Camp Valcartier and then at sea, the setbacks the company experienced, and what life was like once they settled on the Lovat estates near Beauly, Scotland. The book goes on to discuss what the war changed for Hennessy and how it placed his life on a different trajectory, as the once prosperous farm he owned with his wife fell into disrepair during his five year absence, leading him to decide to stay with the military after the war.

I recommend this book as it is honest about the family struggles and personal hardships that Canadians endured during the war. Given that this book is not meant to be a military history, but rather a depiction of what life was like for Pat Hennessy, his family and his fellow members of the CFC, it offers readers exactly what it is supposed to, a wartime tale of the experiences of Pat Hennessy.

Eleven Months to Freedom: A German POW's Unlikely Escape from Siberia in 1915, by Dwight R. Messimer, Annapolis, Maryland: Naval Institute Press, 2016, 196 pages, $29.81 (hardcover), ISBN 978-1-68247-065-7

Reviewed by Colonel (Ret'd) P.J. Williams

When the Editor of this journal sends me a list of books from which to choose for review, they normally have nautical terms in the title, as you'd expect. Not in this case, however. On the contrary, Siberia screams, 'land.' Though to be fair, I suppose, like the sea, it is expansive and can be very, very cold.

The naval angle to this extraordinary story comes from the fact that the escapee in question was a German naval aviator, the same airborne sailors who crewed the zeppelins. In this case, however, the subject, Midshipman Erich Killinger, was an observer in a Rumpler 4B-12 seaplane. The story of how he became a Russian prisoner after his plane had to be ditched in the Baltic following a mission, was transported to Siberia, escaped to China, crossed two oceans and a continent, made it through the Royal Navy (RN) blockade of Europe and back home to Germany makes for a 'ripping yarn' as the Brits would say. And all of this happened to a lad of 21 at the start of the Great War. If young Killinger could take comfort in anything when he was taken prisoner, it was the good news that he wasn't sentenced to work in the salt mines of Siberia, he and his pilot having been accused of bombing a civilian railway station. The bad news, however, is that he was condemned to work in the *coal mines* of Siberia. For life.

At the risk of 'spoiler alerts,' the book does provide some surprising revelations to the reader. The most striking to this reviewer was the extent of the German international pipeline which helped escaping servicemen transit neutral territory such as China and the United States, which did not declare war on Germany until 1917. The author also goes into great detail on how the RN blockade of continental Europe operated and how vessels such as the ship on which Killinger crossed the Atlantic were subject to search. Despite his adventures up until then, this was perhaps the biggest threat Killinger faced in his 16,000-mile trip to eventual freedom. In the end, a combination of pluck, dash and bluff saw him through.

The story does not end with Killinger's return to Germany, 11 months to the day after he was captured. The book covers his subsequent wartime career in which he received the Iron Cross and numerous other decorations. During the inter-war period he became a businessman and eventually retraced his escape route in reverse, starting in New York. With the approach of the Second World War, he joined the Luftwaffe, eventually becoming commander of a prisoner of war camp. He was imprisoned for three years at war's end on charges that the zeal of some of his subordinates exceeded the principles of the Geneva Convention. Interestingly, the Gestapo had wanted him charged with defeatism, due to supposed Anglophile tendencies. Erich Killinger eventually died in 1977, having led what some would certainly call, a full life.

The author, Dwight Messimer has a specialty in German military history, and in writing this book has made extensive use of German sources, from archives both in Germany and the United States. The book is well illustrated with many never before seen (by myself, at least) photos and maps which trace the fantastic journey of Killinger from his capture onwards.

When reviewing books for various journals, I always try to offer comment on the modern relevance of the work. So, while this book holds no gems for those who work at the strategic level, and as far as those who work on the front lines, all I could possibly offer is to ensure one does thorough maintenance on one's airplane – a propeller which came off in mid-flight was what caused Killinger's fateful flight to be cut short. I can say this, however: this fascinating story would be very useful background reading for those about to partake in an escape and evasion exercise, assuming that such activities are still permitted. It is also recommended as a good book to curl up with on a winter's night. I dare say that it'd make a great movie also.

A Maritime School of Thought for Australia: Perspectives, edited by Justin Jones, Canberra, Australia: Sea Power Centre - Australia, 2013, Sea Power Series, No. 1, Commonwealth of Australia, 199 pages, ISBN 978-0-99250-046-7

Reviewed by Colonel (Ret'd) Brian K. Wentzell

Captain Justin Jones, Royal Australian Navy, has compiled the papers that were submitted in response to a short project that involved a call in 2012, by Vice-Admiral

Ray Griggs, the then Chief of the Royal Australian Navy, to consider the creation of a school of maritime strategic thought for Australia. The call resulted in the delivery of 23 papers that covered a full range of subjects and led to a definition of 'maritime strategy' that covered cultural matters, economic issues, international maritime trade, shipping, ocean resources, international relations, defence, environmental issues, and the roles of navies and national governments in the Indo-Pacific region. The matter of adopting a maritime strategy was also considered by five seminars held across Australia in 2013. In addition, the Australian Army and Royal Australian Air Force held conferences on the same subject during the same period. All supported the need for the adoption of a maritime strategy.

The contributors to the book provided overwhelming support for the development of a broad-based maritime strategy for all aspects of the use of the oceans by Australia and Australians. While each author focused on topics of professional interest, the need for a comprehensive Australian maritime strategy was clearly articulated.

All these efforts were rewarded in the 2013 Australian Defence White Paper which included an Annex entitled "The Maritime Strategy for the Australian Defence Force." A declassified version is included as an annex to the book.

I strongly recommend this book to the readers of *Canadian Naval Review*. It would be particularly useful for readers to understand the maritime strategy of one of our most respected Commonwealth and Five Eyes partners. It should provoke some similar thinking and action in Canada, particularly with the increasing interest of world powers in our Arctic, Atlantic and Pacific Ocean waters.

God and Sea Power: The Influence of Religion on Alfred Thayer Mahan, by Suzanne Geissler, Annapolis, Maryland: Naval Institute Press, 2015, 280 pages, CAD $39.11 (hardcover), ISBN 978-1-61251-843-5

Reviewed by Moe Elgayar

The book *God and Sea Power* sets out to establish a new understanding of the essential components that made Alfred Thayer Mahan, the historian, naval officer and family man, misunderstood by contemporary scholars. Geissler's intention to study the influence of religion on the former US naval officer was clearly outlined in the title of the book. The title, however is somewhat misleading, and embodies the saying 'do not judge a book by its cover.' Tackling much more than the impact of religion on Mahan's life, Geissler also delves into the early influences on his life. The perception is that the book solely focuses on Mahan's religion influencing his choices. Instead, it focuses on the dynamic and shifting relationships that religion had on Mahan's personal and professional lives; ranging from his interactions with his superiors and inferiors in the navy to his day-to-day private interactions.

The introduction offers some clarification about the discussion and intentions of the author. Geissler presents a critique of – what she claims to be – false claims about how religion deeply influenced most of Mahan's decisions. Instead, she delves into the anatomy of what made Mahan the person he was. Mahan's family, upbringing and the obstacles he had to overcome are the topic of discussion. Geissler argues that these factors shaped the man he became, and while his religion did affect his decisions, most scholars examining his life use it as a scapegoat for any bad decisions he made or were made by those around him during that time.

Geissler takes a firm stance on Mahan's life: that one cannot understand his works or decisions without being able to grasp his relationship with his Christian faith, but that this relationship was defined by his early childhood and his father's influence. What sets Geissler's perspective apart from other authors is that her perspective goes beyond simply talking about his faith. She carefully picks apart all factors surrounding Mahan that set him on his path with a focus on a heavily criticized relationship – religion and power. At first glance, this book appears to be another biography but Geissler takes the time to take apart other misleading perspectives. *God and Sea Power* rejects many of the perceptions people have about navy officials before the Great War. It goes against the racist, authoritarian and warmongering opinions that many believed embodied religious naval officers and the American Navy as a whole during that time period.

Geissler's biography of Mahan's life offers an interesting lens of analysis written from a critical, and contrasting, perspective based on her interpretations of primary sources. What made the book's arguments stronger is just that – primary sources. The book is both well researched and well written. *God and Sea Power* presents insight into Mahan's complicated life from a historical and theological point of view, rather than simply a political point of view. Geissler's theological background gives the author a unique perspective that may have failed to make it into other studies of leadership.

One aspect I found missing in the book was the influence of more family members on Mahan's life. Where the influence of his brother and father receive great attention, the roles and influence of Mahan's wife and mother were scarcely mentioned. Geissler may not have

had access to the information simply because, at the time, there may have been no accounts of their roles as there was no interest in studying the role of women. Due to her reliance on primary sources, either the information did not exist, or she might not have had access to what she needed to discuss this in the book.

Geissler finds a seamless balance between a story and a descriptive and informative biography. The book gives an interesting perspective on a well-scrutinized naval officer and his methods to show the shortcomings of other authors, while maintaining the fluidity of the story she aims to tell. *God and Sea Power* is not a book found on an everyday shelf; however, military and naval scholars studying military, diplomatic and empirical affairs could truly benefit from learning the global influence of Alfred Mahan. His influence and actions grew beyond American borders and institutions. His predictions and scholarship on the coming of the Great War along with his unrelenting loyalty to his family and faith should be greatly admired by contemporary scholars and Geissler gives a tangible impression that stays with readers long after they put down the book.

The Navy and the Nation: Australia's Maritime Power in the 21st Century, by Tim Barrett, Carlton, Victoria, Australia: Melbourne University Press, 2017, Commonwealth of Australia, 2017, approximately CAD $10.00, ISBN 978-0-52287-159-3 (ebook)

Reviewed by Colonel (Ret'd) Brian K. Wentzell

The author, Vice-Admiral Tim Barrett, is the Chief of Navy for Australian Defence Forces and has commanded the Royal Australian Navy since 2014. He has written this most interesting book at a time when the Australian government has embarked on a program of naval renewal that far exceeds that contemplated for the Royal Canadian Navy. The program of new helicopter landing ships, air warfare destroyers, supply ships, submarines and frigates is well underway and delivering ships now and continuing through 2030.

The purpose of the book is clear. It makes the case that the Royal Australian Navy is a national enterprise that is an integral part of the Australian nation. The navy does not operate in isolation from the other military services or the federal government or the people of the country.

Australians live in a part of the world where relationships with other countries are complex and shifting. According to Barrett, "[s]trategic change is often the result of fundamental discontinuities occurring where the political, economic and social domains intersect, where the knock-on effects of dislocation at one level impact on another" (p. 38).

Amidst the turmoil in the Asian neighbourhood, instability is always close at hand and responsible governments must maintain the ability to conduct self-defence in the face of aggression or the threat of aggression. As Barrett notes, the Australian continent and sea lines of communication are not immune to such concerns. Hence, the Australian Defence Forces must be ready to protect the country and its maritime lines of communication. This cannot be done alone and its strategic allies are a key part of the defensive system.

To be a full participant, the Royal Australian Navy is operating within a whole-of-government approach and is operating with the naval and maritime forces of its closest allies, which include the United States, Japan, Singapore, Indonesia, New Zealand and the United Kingdom. According to Barrett, the navy must remain a "fighting system" (p. 52) and not simply a collection of platforms and people. The system must deliver "decisive and distributed lethality" (p. 53) as part of a larger capability. Barrett says "[a] nation's strength ultimately depends on the strength of its institutions" (p. 75), and the navy is part of Australia's defence institution. Vice-Admiral Barrett concludes by stating, "[t]he Navy is inseparable from the nation" (p. 78).

In closing, this book is an important text that clearly explains the importance of a national navy to the success and survival of its country and people. It is highly recommended to all readers of *Canadian Naval Review*.

Writing to Think: The Intellectual Journey of a Naval Career, by Robert C. Rubel, The Newport Papers No. 41, Newport, Rhode Island: Naval War College Press, 2014, 245 pages, figures, notes, appendix, ISBN 978-1-93535-227-3

Reviewed by Doug Thomas

The US Naval War College (USNWC) in Newport, Rhode Island was established in 1884 as an place for advanced courses of professional study for naval officers. It now educates and develops leaders at specific stages in their careers from all services, US government agencies and departments, as well as international navies including the Royal Canadian Navy.

The USNWC Press publishes a number of journals and studies, including its quarterly review and the Newport

Papers which are extended research projects that the Director, the Dean of the Center for Naval Warfare Studies (CNWS), and the President of the Naval War College consider to be of particular interest to policy-makers, scholars and analysts. These book-length monographs cover a variety of subjects, but ideally relate to contemporary operational or strategic concerns in the realm of maritime security.

The author of *Writing to Think*, Captain Robert Rubel, USN (Ret'd), was a career naval aviator and since his retirement has been a faculty member of the USNWC, including the Dean of its CNWS since 2006. A major accomplishment of his tenure at CNWS was the development of a very influential document entitled "A Cooperative Strategy for 21st Century Seapower," which was signed by the Chiefs of the US Navy, the US Marine Corps, and the US Coast Guard. It was published in 2007 and remains the current doctrine regarding operations with other navies. During his time as a faculty member, he has created a substantial body of published writings about naval strategy and warfare. Volume 41 of the Newport Papers is a collection of 17 of these essays, in four categories: Naval Strategy; Naval Aviation; Joint Operations; and War Gaming.

Rubel is an innovative thinker, for example he questions over-dependence of the USN on its aircraft carriers in Chapter Eight "The Future of Aircraft Carriers." Discussion of their development during the early 20th century as capital ships replacing the battleship quickly moves on to their utility in today's geopolitical situation, the importance of numbers and the issues around having only one shipyard that builds nuclear-powered carriers such as the new *Ford*-class, arguably one of the most complex objects ever built. An interesting statistic is that one of these huge ships with its embarked air group costs as much as 10 nuclear-powered attack submarines or 20 guided-missile destroyers.

Rubel's thinking is not mired in the past – he speculates on the role of the Chinese DF-21 anti-ship ballistic missile and whether that would be an effective counter to a US carrier battle group in East Asian waters. He also considers what the impact of carrier-based unmanned aircraft/unmanned combat aircraft (UAVs/UCAVs) might be. Unmanned aircraft can have a longer range and a very different stealthy shape if they don't have to provide a hospitable environment for people, but there is a trade-off with flexibility and lack of spontaneity should something unexpected pop up.

This book is not all about maritime strategy. Thus, Chapter Ten is titled "Tales from the Platform," and describes Rubel's time as a Landing Signals Officer (LSO) in USS *Dwight D. Eisenhower*. There is a lot of jargon to wade through as it was originally written for another naval magazine, but it is very funny and well worth searching for this publication online!

In conclusion, this and other Newport Papers are a treasure trove for academics and naval professionals alike – and occasionally also for those who would like to reminisce about their days at sea. Although there was a limited print run of this publication, it and some other USNWC Press offerings are available in their entirety online.

The Endless Battle: The Fall of Hong Kong and Canadian POWs in Imperial Japan, by Andy Flanagan, Fredericton, NB: Goose Lane Editions, 2017, pp. 204, photos, index, ISBN 1-978-77310-006-7

Reviewed by Ann Griffiths

This is a personal account by Andy Flanagan of his father's service in Asia in the Second World War. Rifleman James Andrew 'Ando' Flanagan served in The Royal Rifles of Canada, and was sent with almost 2,000 other Canadians in November 1941 to guard Hong Kong. He arrived shortly before it fell to the Japanese on Christmas Day 1941. He enlisted in The Royal Rifles with friends from Jacquet River, New Brunswick, to serve his country, see the world and experience some excitement. This book gives the details of his service.

Having just arrived to support Hong Kong, the New Brunswickers had little time to prepare for the battle with the Japanese or for the aftermath. The troops in Hong Kong were badly outnumbered and received no reinforcements and although they fought fiercely, they were ordered to surrender. After this Flanagan and his mates became prisoners of war (POWs) of the Japanese Imperial Forces.

Flanagan endured three-and-a-half years as a prisoner of war, and experienced the worst that the Japanese had to offer. He experienced hunger, disease and grueling work, combined with brutal punishment and cruelty. He watched his old friends from New Brunswick, and new friends formed in the military, die as the time passed. When he was finally released he went home to re-start his life – but suffered thereafter from the traumas of his captivity.

The book unfolds as a story told by Flanagan. He kept a record of the events of the 18-day battle of Hong Kong hidden in his boot. And he managed to keep a journal throughout his internment, although occasionally parts

of it were removed and/or censored by the Japanese. The rest of the story was recorded and then transcribed by his son to produce this book.

The account of Flanagan's long days as a POW provide a powerful story of obsessions about food, the terrible living conditions and the daily humiliations. At home, his family knew nothing of his whereabouts – or even if he was alive. He managed, as did other Japanese POWs, to send a short wave message which was picked up on the US West Coast and transmitted to his parents, but letter-writing and certainly receiving letters was not a regular occurrence. His parents finally received a notice from the Canadian army after Japan surrendered which stated simply his name, that he was "safe in Allied hands" and that his condition was "fair." At 68 pounds at the end of his life as a POW, 'fair' may have been an over-statement.

The book is interesting, and the photos that are included help to bring the person and the places to life. The book nicely illustrates the ordinary people who experienced such extraordinary events and stood up in service of their country.

Credit: Himaly Fernando, Maritime Forces Atlantic

*Canadian Naval Review editor Dr. Ann Griffiths fires a .50 calibre machine gun aboard HMCS **Charlottetown** during a Canadian Leaders at Sea event in November 2018.*

Credit: Bill Gard

Wendall Brown, Chair of the Canadian Naval Memorial Trust, presented the CNMT Essay Competition first prize cheque to Adam MacDonald on 12 December 2018 at the CNMT's Christmas reception on The Bridge at Juno Tower in CFB Halifax. Adam's essay makes a case for a Canadian sea-based ballistic missile defence capability in the new Canadian Surface Combatant.

2019 CANADIAN NAVAL MEMORIAL TRUST

Essay Competition

Canadian Naval Review will be holding its annual essay competition again in 2019. There will be a prize of $1,000 for the best essay, provided by the **Canadian Naval Memorial Trust**. The winning essay will be published in *CNR*. (Other non-winning essays will also be considered for publication, subject to editorial review.)

Essays submitted to the contest should relate to the following topics:

- Canadian maritime security;
- Canadian naval policy;
- Canadian naval issues;
- Canadian naval operations;
- History/historical operations of the Canadian Navy;
- Global maritime issues (such as piracy, smuggling, fishing, environment);
- Canadian oceans policy and issues;
- Arctic maritime issues;
- Maritime transport and shipping.

If you have any questions about a particular topic, contact cnrcoord@icloud.com or naval.review@dal.ca.

Contest Guidelines and Judging

- Submissions for the 2019 *CNR* essay competition must be received at cnrcoord@icloud.com or naval.review@dal.ca by Monday, **30 September 2019**.
- Submissions are not to exceed 3,000 words. Longer submissions will be penalized in the adjudication process.
- Submissions cannot have been published elsewhere.
- All submissions must be in electronic format and any accompanying photographs, images, or other graphics and tables must also be included as a separate file.

The essays will be assessed by a panel of judges on the basis of a number of criteria including readability, breadth, importance, accessibility and relevance. The decision of the judges is final. All authors will be notified of the judges' decision within two months of the submission deadline.

Have you joined the discussion yet?

Visit Broadsides, our online forum, and join the discussion about the navy, oceans, security and defence, maritime policy, and everything else.

Visit **www.navalreview.ca/broadsides-discussion-forum**

So you don't miss any of the action, make sure you follow us on Twitter, **@CdnNavalReview**

The ***Kingston***-class MCDVs HMC Ships ***Glace Bay*** and ***Summerside*** nestle between the Norwegian mine countermeasure vessels KNM ***Hinnøy*** and KNM ***Rauma*** on 4 November 2018 in a Norwegian fjord during Exercise Trident Juncture.

Credit: Aviator Braden Trudeau, Formation Imaging Services