



# the Ensign

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Her Majesty Queen Elizabeth II and His Royal Highness Prince Philip, Duke of Edinburgh, review the assembled fleet from aboard the reviewing ship, HMCS *St. John's* during the International Fleet Review in Halifax on June 29th, 2010. Vice-Admiral Denis Rouleau, Vice Chief of the Defence Staff, stands to the left of Her Majesty and Prince Philip.

Photo HS2010-0362-001 by Johanie Maheu, Formation Imaging Services, Halifax, NS

# The President's Bridge

By Earle Shirley

**H**ello everyone! Let me start off by saying that I hope you are all having a wonderful summer. As I write this, my family and I are enjoying a bit of vacation in Penticton. It reminds me that we are so blessed to live in such a beautiful country; so fortunate to have the freedom and opportunity to explore and enjoy all that Canada has to offer, whether in beautiful British Columbia or 'down home' in the Atlantic Provinces, or at any place in between. I am mindful of the fact that this type of freedom we all enjoy is part of the legacy left to us by our veterans and fought to maintain by our men and women of today's Canadian Forces. In my opinion, despite their increased popularity amongst Canadians these days, still not enough people truly appreciate what our sailors, soldiers, airmen and airwomen do for us. That is why it is vitally important for institutions like the Naval Museum of Alberta and its supporting Society to continue to work together to remember the sacrifices our veterans have made; to preserve the heritage and legacy of the Canadian Navy, and to educate our fellow Canadians (especially the children) about what an important role the navy plays in the life and wellbeing of all Canadians.

In my last article to you, I mentioned how the Naval Museum of Alberta Society is changing from an 'operating' society into a more supportive role as the navy takes over actual day-to-day operations of the museum. This transition will continue to evolve, but I am very pleased to be able to report that some significant progress has been made. In May, our Vice President, Greg McKenzie and I met with Graeme Arbuckle, the Director Navy History, and the then museum's Assistant Curator, Alison Mercer. It was a very productive meeting, as we were able to deal with a number of issues, including some misunderstand-

ings that had been circulating about. I won't go into all of them, but as an example, I will mention an item that a number of folks had expressed some concern about, namely the disposition of artefacts currently owned by the Society and on display in the Museum. Mr. Arbuckle fully understood the attachment of many of these artefacts to Calgary (and Calgarians). He has taken significant measures to ensure that such artefacts remain in Calgary, essentially forever. Additionally, he has made it clear that he wants representation from the Society to join him at TMM Council meetings, as he feels our voice is important there. So, contrary to rumours you may have heard, things are, in fact, progressing well on the 'transition' front.

As all of you are aware, many, if not most public and private institutions have banned smoking and drinking in the workplace. If you wish to smoke you must go outside, and if you wish to drink, you must go to a pub or a mess on DND premises. If the Naval Museum of Alberta Society (NMAS) Board of Directors knowingly condoned, allowed, and was aware of drinking on the premises, and one of our volunteers was in an accident on the way home, every individual member of the Board could be sued. Although the Naval Museum of Alberta Society's Board of Directors carries liability insurance, no insurance company will cover deliberate negligence or overt disregard for the law. This means that each individual Director could potentially lose their home and personal life savings in the case of such a lawsuit.

However, it would appear that a very small handful of our volunteers have refused to accept or understand this, and I now must bring clarity to a recent Board decision to prohibit the use of unlicensed alcohol on the premises of the Old Museum Building. This Board decision has caused

a significant amount of bad feelings amongst a few of the volunteers who work there on a regular basis. So, let me be clear. The law is very clear: alcohol can only be consumed at home, in licensed premises, or through obtaining a liquor license, as was done recently for the Volunteer Appreciation Barbecue. There is a high level of intolerance regarding the inappropriate use of alcohol, and institutions like ours are now held to a much higher standard of responsibility than in the past. All charitable societies have received notice in writing that serious fines ranging from \$1,500 to \$200,000 can be levied for infractions. Our Society would be irresponsible to risk fines of this nature. It is also very evident that should our Society Directors or Executive Director be charged for infractions, no amount of insurance can protect them from personal responsibility, as they would be knowingly in contravention of the law.

Think about it. Should we be prosecuted, this would also bring disrepute not only to our Directors and staff, but to the Society, to HMCS *Tecumseh*, and to the Department of National Defence, on whose property we are located. The loss of reputation has the potential to affect our ability to maintain our charitable society status, and to garner grants from both private and public funders. Next, we now house a cadet corps in our building, and we must continue to provide a good example for these young people. Further, we are reminded that the old naval museum is a working environment with machinery and tools. No responsible work environment condones the consumption of alcohol by its workers while at work. Lastly, if one of our volunteers should ever be in a collision on the way home after consuming a beer, it is entirely possible that whether drunk or not, the other party could successfully sue not only the volunteer, but our Society. Fatalities and injuries are tragic enough, without adding to the mayhem through irresponsible behaviour on the part of a Society. We value our Society, volunteers

and members too much to put them at risk. So, unlicensed consumption of alcohol on the premises will not be permitted.

I will conclude by saying that I have an immense respect for all the volunteers who help make the Society and the Museum the great organizations they are. Although it may sound like just words, it is no less true that we would not be here if it were not for the vision, the loyalty and the dedication of our volunteers. I know that I am not alone when I say this; all of the Board members

(who are themselves, volunteers) I am sure, share this view.

I hope that I have been able to shed a little light on what's been happening and I hope that you all have a great summer. If you can, make it a point to drop by the Museum; we just recently opened the Enigma Machine display.

Remember, it's YOUR Museum!

Yours aye,

Earle

## Executive Director's Cabin

By Murray Bialek

The Naval Museum of Alberta Society was a sponsor of the Centennial Naval Veterans Dinner held in the Naval Museum on May 1st, with the NOAC and CNVA actually running it. The dinner was a great success with 161 guests attending. Our Vice President, Greg McKenzie, acted as the Master of Ceremonies. You will find some photographs on page 5 of this issue of *The Ensign*.

Another Naval Centennial event was the creation of a Centennial Rose named 'Navy Lady' by the Wren Associations across Canada (spearheaded by the Toronto Branch) and Agriculture Canada, with a local ceremonial planting being conducted at the Colonel Belcher Care Centre.

The Centennial Rose event was organized by Johanne Aylett, and the representative for the NMAS was Harold Hutchinson. The event was a great success with over 100 in attendance.

Terry Thompson attended an Alberta Museums Association (AMA) forum on behalf of NMAS and provided input with regard to strategic planning and direction, along with many other Alberta museums, toward the AMA's future.

Shannon May, our Summer Temporary Employment Program (STEP) student, started working for the NMAS on May 11<sup>th</sup> as a result of a grant from the Province of

Alberta. Shannon will be entering her last year at the University of Calgary with a major in art history and minor in museum studies.

I attended the Organization of Military Museums of Canada (OMMC) 44<sup>th</sup> Annual Museum Studies Programme this year as part of my professional development requirements in compliance with the AMA's operational staffing grant.

RCSCC *Undaunted*, NLCC *Captain Jackson* and The Navy League of Canada Calgary Branch, have almost completed the move from their condemned ATCO trailer into the front area of the Old Museum Building on the grounds of HMCS *Tecumseh*. The NMAS will continue to utilize the upper level offices and the rear portion of the building for the collection and storage of artefacts as well as a restoration workshop.

As previously reported (and featured later in this issue of *The Ensign*), the NMAS now has an authentic German naval Enigma machine courtesy of our local philanthropist, Mr. Fred Mannix. Fred has been a staunch supporter of the NMAS since its inception.

The official opening of The Enigma Exhibit on July 11<sup>th</sup>, was presided over by Mr. Mannix and Vice-Admiral Dean McFadden, Chief of the Maritime Staff and

head of the Canadian Navy.

The NMAS also held its Volunteer Appreciation BBQ on Sunday, July 11<sup>th</sup>. This annual event, in addition to the annual Volunteer Brunch held in December, pays tribute to our many volunteers without whom the Naval Museum would not be the success it is today.

The seventy-five people who attended enjoyed tasty hamburgers, gourmet hot dogs, fantastic baked beans, various salads, cakes, cookies fruit and libations. Almost everyone present won a door prize: a Naval Centennial calendar or a large "NAVY" car magnet.

I would especially like to thank the Head Chef, Linda Bialek; the Chief BBQ Cook, Jason Chartrand; the Cook's Assistant, Elly Bialek; the Wine Steward, Cal Annis; and Assistant Curator, Shannon May for their assistance.

At the last NMAS Board meeting in June, a revised logo was chosen for our Society which is very similar to the original logo, but has the word "Society" within a ribbon at the bottom. Once the update to our website is completed, you will be able to see it in full colour. (*Why wait... you can now see it in 'The Ensign' banner at the top of our front page! Ed.*)

When driving past HMCS *Tecumseh* recently, you might have noticed the 'new' look to our ATCO trailer attached to the NMAS building. Mr. Ron Southern, who is the President of ATCO Industries, normally drives past the property on his way to and from the office. When he noticed our trailer was beginning to look somewhat shabby, he offered, through ATCO Manager Wade Adams, to have it restored at no cost to our Society.

Subsequently, a number of ATCO personnel were involved with fixing the trailer. A special thank you must go to Rob Martin, Richard Robinson, Mark Anderson and Tony Zuric. Thanks are also due to Don Connolly and Gary Hansen for getting the trailer ready for painting the interior.

As well, Don and Gary built the display cabinet for the Mk.46 torpedo which, after



being on display at the Stampede, is now on permanent display in the Museum.

**Donors recognized**—I would like to thank the following donors who recently made artefact donations: Charles V. Rolfe, Fraser H. McKee, Scott Eagleson, Ed Simpson, Vicki Lyn Dice, Rita Carey, Bill Wilson, Darren Havelock, Doug Ewing, David Cathcart, Ray Carlyon and as usual, we always have some anonymous donors.

**Recent donations**—a 1955 Halifax Memorial on Citadel Hill programme, RCN uniforms, Sea Cadet uniforms, books, newspaper clippings, photo albums pre-WWII, postcards, booklets, prints, RCN trade manuals, shoulder flashes, CF shoulder boards, ship diagrams, cloth badges, flags, videos, issues #1-75 of the Canadian Naval Divers Association newsletter *The Dippers Digest*.

A special thanks is always in order for our watchkeepers who greet guests in the museum on a daily basis and especially for Bob Bryden, our watchkeeper coordinator, who spends countless hours every week lining up the shifts for our watchkeepers.

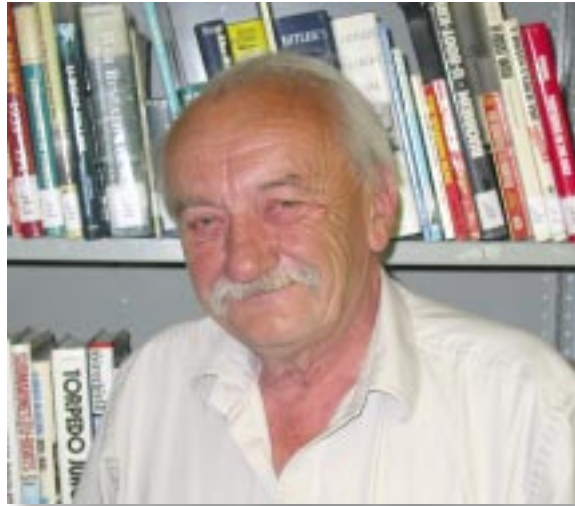
On a sad note, our former NMAS Volunteer Library Manager, Cliff Stewart, passed away in late June after a brief illness. Cliff had been a volunteer with us for many years. He was also a former naval officer who joined the RCN in the 1950s; served as Calgary Branch President and National Director of the Naval Officers Association of Canada and was a recipient of the NOAC Gold Medallion. (As this issue of *'The Ensign'* was being prepared, we also learned of the passing of Ed Simpson who was also a very dedicated, long-term volunteer with the NMAS. Ed.)

### **VOLUNTEERS NEEDED!**

If you would like to greet museum visitors and have one day available per month; or, if you have at least one day available per week, have some computer skills and can help in the office, please telephone Murray Bi-alek, at 403-242-0002.



# Volunteer Spotlight



## Bruce Connolly

Bruce has just been appointed as the new Volunteer Assistant Curator for the Naval Museum of Alberta at The Military Museums. He is a retired commercial/industrial photographer. He and his brother Don started volunteering for the museum in 1992, and since then he has performed quite a large number of different jobs. Bruce has been a watchkeeper, coordinator, gift shop manager, library cataloguer, library manager, archives manager and researcher as well as photo cataloguer.

Bruce is tenacious when it comes to performing research or digging out answers to historical questions and he can always be relied upon to lend a helping hand. He has also, on numerous occasions, acted as the chief photographer for the museum. Bruce is very creative and also builds large, intricate models to scale, such as his latest model of the destroyer, HMCS *Algonquin* (see photos opposite). Many of the displays, exhibits and the associated signage in the NMA were created by Bruce. Not only does he work on the 'administration' side of the museum, but he has also worked on artefact restoration and is not afraid to get his hands 'dirty.'

He will literally spend seven days a week volunteering and is quite modest and unassuming about his abilities and accomplishments. It is no wonder that Bruce has been a previous winner of the prestigious 'Volunteer of the Year' award of the Naval Museum of Alberta Society.

Added to his many accomplishments, Bruce will act as the Assistant Curator of the NMA until a permanent curator is hired by DND.



Two views of the large scale model of the V-class destroyer HMCS *Algonquin* in her wartime configuration as created by Bruce Connolly. The model is now on display in the Naval Museum of Alberta.



Guests enjoying a chat. Standing is Cdr Greg McKenzie chatting with Barbara and Neil Murray.



Harold Hutchinson and CPO1 (Ret'd) Harry Wade.



The head table. L to R: Andy Bogle, Bill Wilson, Phyllis Wilson, Linda Bialek, Greg McKenzie (standing), LCdr Rob MacLeod (CO of HMCS *Tecumseh*), Dora McLeod, and Murray Bialek.

## Naval Centennial Veterans Dinner



May 1<sup>st</sup> 2010 in the Naval Museum of Alberta



# Without our volunteers there would be no Naval Museum of Alberta! Thank you one and all!



The 'chow line.'



L to R: Jason Chartrand (BBQ Chef) and Elly Bialek.



Kay Luna.



Frank and Barbara Saies-Jones.



**Volunteer Appreciation Barbecue  
July 11<sup>th</sup>, 2010**



L to R: Syd Young, Bill Garde and George Pumple.

# Organization of Military Museums of Canada

By Linda Bialek

Both Murray and myself successfully participated in the Organization of Military Museums of Canada (OMMC) 44<sup>th</sup> week long annual Museum Studies Programme this year in Nova Scotia. Murray attended as part of his professional development requirements in compliance with the operational staffing grant received from the Alberta Museums Association, while I, as an NMAS board director, paid for my own flight and course registration.

Over the course, a variety of museum related topics were dealt with in some depth. A session on *Understanding Acrylic Fabrication* explored what types of acrylic cases should be used for various purposes. For example, paper artefacts should be housed under Plexiglas® or acrylite, which filter ultraviolet light, which is destructive to paper artefacts. Which kinds of materials can be used, how they are produced, what a quality product looks like, cleaning and a number of other topics were presented. Often, museum curators or directors are required to order cases for a variety of purposes. Knowledge of what is available, what properties are needed and how good fabrication is conducted, are important when considering the purchase of such cases which are often expensive.

A session on *PCB (Polychlorinated Biphenyl) Safety and Environmental Programs for Accredited Museums* was presented by Sean Hunter from the Directorate of History and Heritage (DHH). PCBs are synthetic chemicals used in industry. They do not break down and cannot be burned easily. PCBs are likely a human carcinogen and are a persistent organic pollutant. In the 1960s and 70s, they were used in military applications, such as, the ballast for fluorescent lighting, capacitors,

transformers and hydraulic systems. Handling of PCBs is covered by regulations from the Environmental Protection Agency. These regulations are extremely strict and do not take into consideration Canadian Forces museums, which may have artefacts from the PCB era. PCBs in museums could include transformers and capacitors, fluorescent light ballasts, coolants, plasticizers in paints, flexible PVC coating in electrical wires and electronic parts, cutting oils, reactive flame retardants, lubricating oils, hydraulic fluids, sealants and adhesives. So, why should museums care? As previously stated, these EPA regulations are very strict, and some base commanders have been personally fined because of PCBs. As well, some museums have been asked to surrender noncompliant artefacts to the EPA. There is definitely great pressure for environmental compliance on the part of museums.

DHH has declared that PCBs in museums can potentially be a major problem and is dealing with Canada's Environmental Agency with regard to establishing some kind of policy for DND museums. DHH will be implementing a PCB program focused on protecting military museums.

We will hear more about this in the future.

In addition, there were a number of other presentations:

- CFAMS (Canadian Forces Artefact Management System);
- storage media such as, the use of external hard drives and digital data recovery;
- preventative conservation of uniforms;
- maintenance of wooden artillery pieces;
- presentations by a number of different museums on their history, what they do, and new initiatives they are undertaking;
- period actors and relevance to re-living and retelling history;
- archaeological finds;
- visits to three museums; and,
- new Canadian Forces medals and bars.

As usual, the programme was very full, beginning at 8:00 am most days and ending at 8:00 to 10:00 pm each evening. In addition to the valuable programme were the connections made between museums, and the discussions about various artefacts, including an informal session on *artefact swapping*. This personal networking is one of the most important aspects of the programme.

In conclusion, it was a successful and useful course which will benefit the Naval Museum of Alberta Society.

## Assistant Curator of the NMAS

By Shannon May

Many people see the exhibit space of a museum, with its fascinating artefacts and displays, and never realize what goes on behind the scenes of such a facility. The Naval Museum of Alberta Society (NMAS) is still very active in the behind-the-scenes support of the Naval Museum at The Military Museums

through artefact loans and hands-on labour. Our extensive collection of artefact and archival materials is an irreplaceable resource for museums to use for display and research purposes. As well as supporting the Naval Museum, the NMAS also continues to expand its collection of historical naval artefacts. Artefacts are still

being donated to the NMAS on a weekly basis. The donated artefacts are catalogued into the collection through a process called accessioning.

Accessioning is a lengthy process in which an object is assessed on its condition and relevance to the collection as well as researching its background. During the accession process, the object is given a unique accession number; a number which relates solely to that object within the collection. The object is then also tagged, photographed and entered into our collections' database. Within the last months, the NMAS has received several large donations of uniforms and other desirable items.

Another way in which the NMAS helps to support and inform the naval community is by helping with the distribution of invitations and information on upcoming events (*not to overlook preparation and circulation of 'The Ensign.' Ed.*), as well as the loaning of artefacts for various exhibits. Just recently, the NMAS loaned several of its art works, photos and other artefacts to be displayed in an exhibition at The Military Museums entitled *Prairie Boys at Sea: 100 Years of Alberta's Navy*. Unfortunately the exhibit will have ended by the time you are reading this. Another event that took place recently at the NMAS was our Volunteer Appreciation Barbecue. We were glad to be able to show our gratitude to all the volunteers, without whom the running of the Society would be a much more difficult task. It was amazing to get so many people out to the gathering, enjoying the fun and food. Our thanks go out to all the wonderful volunteers who help at the NMAS!

These larger events are just some of the more interesting and fun occasions we get to be involved in, but they only occur occasionally. It is activities such as answering telephone and email requests, filing, photocopying, ordering office supplies, appraising artefacts, updating databases, typing display write-ups, organizing computer files, writing thank you letters and tax receipts, updating forms,

mailing and receiving packages, organizing mail-outs, keeping track of incoming and outgoing loans, making loan agreements, putting together and mailing our watchkeeper schedules, dealing with requests from other museums for information and loans, supervising and helping visiting researchers, updating membership information and the other endless tasks that present themselves on a daily basis keeping our staff busy.

There are also a number of ongoing long-term projects at the NMAS, such as, the upgrading of our artefact storage and management procedures, a comprehensive inventory of the collection, creating a

training manual for new volunteers and employees, ongoing upkeep of the library and archives, rearranging the artefacts in storage for better access, keeping the CFAMS (Canadian Forces Artefact Management System) up to date and consistent, working on getting our website back up and running, and much, much more.

These are just some of the things that go on behind-the-scenes at the Naval Museum of Alberta Society. If you have an interest in becoming more involved with some of these tasks, please do not hesitate to contact us about volunteering; we always have plenty of interesting jobs you can help with.



## Calgary Naval Centennial Ball



Saturday, October 23<sup>rd</sup>, 2010

~ in ~

The Crystal Ballroom  
Fairmont Palliser Hotel

(133 - 9<sup>th</sup> Avenue SW, Calgary)

Cocktails at 1800 ♦ Dinner at 1900

Dance to the live music of 'The Downstairs Band'  
(1940s ~ 1950s theme)

\$125 Per Person

Mess Dress, Black Tie, Uniform, Business Suit; Ladies Equivalent  
Medals, Miniatures, Decorations

RSVP to Leslie Young at [calgarynavalball@gmail.com](mailto:calgarynavalball@gmail.com)  
or telephone 403-239-1341 ~ No later than Friday, October 15<sup>th</sup>

Payment by cheque **IN ADVANCE ONLY**  
Please make cheque payable to "NOAC"  
and mail to

Calgary Naval Ball  
c/o HMCS Tecumseh  
1820 - 24th Street SW  
Calgary AB T2T 0G6



# Women Serving in WWII

By Marguerite L. Perry

Early in the war years, there were some 1,700 Auxiliary Personnel working for the RCAF, but by July 1941, the women were accepted as full members of the Royal Canadian Air Force (Women's Division), or more familiarly known as WACS. A month later, the military recruited women into the army, and they were known as CWACS. Finally, the navy decided they had a place for women too and established the Women's Royal Canadian Naval Service (WRCNS), more commonly known as Wrens. Britain had long since formed the Women's Royal English Naval Service from which the acronym Wrens was derived. Although Canada substituted the "C" for the "E", they were still called Wrens.

By the end of 1941, the Royal Canadian Navy began an unprecedented expansion, thus increasing the need for more men to man new ships. This resulted in the need for people to take over shore jobs and that's where the Wrens were utilized.

In January 1942, naval authorities took definite steps towards creating a women's branch. Our naval headquarters called upon the British Admiralty for the temporary loan of suitable experienced officers of the Women's Royal Naval Service.

In April 1942, Captain Eustace Brock, who had been overseas with the Admiralty as Canadian Liaison Officer, was brought back to Canada and appointed Director of Women's Services. A month later, three officers of the British Wrens arrived to assist him.

They began an immediate tour of Canada to set up recruiting depots to interview candidates. Six days later there were 800 applications on file. Sixty-seven were chosen to form the first training class in Ottawa and many became officers. Eventually, a training base was set up in an unused training school in Galt, Ontario.

In June 1943, the training establishment was commissioned as a full training ship in the RCN. It was christened HMCS *Conestoga* and became the first Canadian ship in the RCN with an all-women crew. After the initial class of sixty-seven were trained in Ottawa, everyone else went through six weeks of basic training at Galt. From there the women went on to special training at the various 'Stone Frigates' around the country.

Eventually, the base at Galt, Ontario was closed and both men and women took their basic training at HMCS *Cornwallis* in Nova Scotia.

As the war at sea escalated, Wrens took on more and more of the land based duties. They manned lonely wireless stations

which kept tabs on the movements of German U-boats in the North Atlantic. As signal women, they directed warships in and out of port. At Operational Headquarters they plotted the movements of escort ships and convoys on large wall charts. But perhaps the full extent of the women's share became most apparent when the Wrens showed up fully qualified, as electrical artificers. That must have been a great shock to the men on board those ships!

In addition, Wrens were postal clerks, censors, secretaries, telephone operators, messengers, truck drivers, chauffeurs, officer's aides, cooks, laundresses, sick berth attendants and tailors. There were probably many more technical jobs of which I never heard, because once you were in the service, you were not supposed to talk about what you were doing since ... *Loose Lips Sink Ships!* Thus, Wrens were often referred to as the 'Silent Service.'

## RP Torpedo-19 From Rocky Point Garbage to Stampede Display

By Penny Rogers, Staff Writer, 'Lookout,' CFB Esquimalt

What happens when you offer up a challenge to a group of talented employees from Canadian Forces Ammunition Depot (CFAD) Rocky Point? You end up with a built-from-scratch model torpedo for display at the Calgary Stampede, where an estimated one million people will attend.

Word spread at the Ammunition Depot earlier this year that the Naval Museum of Alberta in Calgary was looking for items that would commemorate and celebrate the Naval Centennial. On the museum's list was a cutaway of the MK 46 ASW Lightweight Torpedo, the model currently carried by all major Canadian warships, and

by both Sea King helicopter and Aurora Long Range Patrol Aircraft.

Museum staff had tracked down a company in Newport, Rhode Island, who could provide exactly what they were looking for, but the cost for the full cutaway would be \$75,000.

Paul Shields, Production Supervisor Torpedo / Missile Maintenance, saw a string of email traffic regarding the search for the cutaway and decided it would be an excellent opportunity for their shop to lend a hand.

"We started looking into the process and everyone in the shop took a part or a role in the building of the torpedo, depend-



The 'declassified' cutaway of the MK 46 ASW Light-weight torpedo.



ing on what their specialty was," said Shields.

The cutaway took about two weeks to complete, and depending on each member's specialty, the time each spent working on the project varied from a few hours to the full two weeks.

First, the electronics were completely declassified and then components to simulate the real parts were fabricated and installed, all from non-repairable or unserviceable assets, so no actual torpedo was 'injured or damaged' to create the display, according to Shields.

The fuel tank was cut away to expose the inner workings, then Mark Waddington and Casey Clinton took about two weeks to carefully mill out the shell, and each exposed component in the after body (engine / propulsion section), which proved to be the biggest challenge. Also a hurdle was matching the cut lines and providing the best view possible.

Other team members included Mike Kubisheski, Jim Carlson, Pat Wade, Ray Campbell and Neil Tremblay.

"It was a bit of a head scratcher when we were assigned to this task," explains Clinton. "We had to come up with a cuta-

way with as much detail exposed as we thought appropriate for the general public, while keeping the display in compliance with declassification. We wanted to show

the complexities, while keeping the display robust enough to withstand shipping and harsh handling."

The display torpedo did survive shipping and now the Naval Museum of Alberta volunteers will take over to construct a base and Plexiglas® cover for display at the Stampede grounds (*this was written prior to this year's Stampede. Ed.*), and subsequently in the museum where it will remain on permanent display.

"The thought of one million people attending the Calgary Stampede where this will be displayed is fairly impressive," said Shields.

"The finished product the guys made was fascinating, even to people who have worked with torpedoes for years."

Clinton is proud of the final result as well. "It gave us a sense of artistic creativity that we never get to experience in this atmosphere of formal processes and procedures," he said. "We hope this display will be an interesting piece of military history for generations of people to enjoy."

## What Are Museums For?

By Linda K. Bialek

The question, *What are Museums for?*, seems to be a little silly on the surface. We all know what museums are for — they house old things from the past that we can go and visit to see how it was then in the world. But, upon a closer look, the question, *What are Museums for?* is much deeper. Are museums just warehouses of artefacts that are collected by an interested few to preserve them just in case someone might want to look at them? Or, are museums a much more vital part of present day life? These concepts have been debated in the museum world for a number of years.

The Alberta Museums Association will consider such questions at its Annual Conference this year in Edmonton. Up for discussion is this issue: museums evolving

from being about something, to being about someone, to being about community. In a paper entitled: *Place-Making: Museums and Building Community Position Paper*, it is proposed that museum boards, directors and curators should be "going beyond the five primary functions all museums must perform. Museums have even more profound responsibilities to their communities: they are places of learning; they are places for dialogue; they are places of caring; they are places for gathering; they are places of beauty."

"Museums can accomplish these responsibilities through a variety of means. For example, through community partnerships, museums can engage citizens of their communities in the development of exhibitions and programs. By understand-

ing the importance of their buildings as places to create connections in the community, museums provide safe spaces for gathering, exploring and informing the public. Museums play a role in the vitality of communities by bringing people together to share experiences."

"Museums are public places that have

the potential to build community, to define place, and to build a sense of identity. Would Paris be Paris without the Louvre? ... Place-making can be defined as 'the art creating public places of the soul' that uplift and help us to connect to each other."

As we volunteers move forward in our support of the Naval Museum of Alberta,

these ideas need to be considered carefully. Our goals have been to protect, preserve and remember. Perhaps we also need to focus on connecting with our community and creating a place.

So the question: *What are Museums for?* is very relevant and worthy of our exploration.

## The Opening of the Enigma Exhibit

On Sunday, July 11<sup>th</sup>, 2010, the Naval Museum of Alberta Society hosted the unveiling of the Enigma Exhibit at the Naval Museum of Alberta. Mr. Fred Mannix, a local philanthropist who loaned the Enigma Machine to the NMAS, presided over the opening of the exhibit together with Vice-Admiral Dean McFadden, Chief of the Maritime Staff and commander of the Canadian Navy. Many other dignitaries and museum volunteers were in attendance.

All photos Julie Vincent Photography



ABOVE – Mr. Fred Mannix (left) and VAdm Dean McFadden, Chief of the Maritime Staff, preside over the opening of the Enigma Exhibit while naval 'sentries' in WWII period uniforms look on.

BELOW LEFT – NMAS President Earle Shirley and Captain(N) Bill Wilson during the opening.

BELOW RIGHT – Admiral McFadden addresses those in attendance.





*A puzzle called...*

# Enigma

By **Cyndy Butler**

**N**ot until the early 1970s did the role of secret intelligence in the Allies' Second World War victory become widely known. The reason: anyone involved in intelligence work, including the breaking of the infamous encryption device called Enigma, was pledged to secrecy, not just during the war, but long after it ended. Historians, in fact, still debate whether Allied use of secret intelligence was a decisive factor in waging and ending the war, or merely shortened the conflict, thereby saving thousands of lives.

With the invention of radio in the late 1890s, the military could send messages without having to lay wires. However, as the First World War demonstrated, anyone on either side could easily intercept and break those messages' secret codes. While radio communication had modernized the coordination and direction of military movements, the encoding and decoding of sensitive information—cryptography—had to change. Pencil paper ciphering was no longer good enough.

Change occurred when a German inventor and electrical engineer, Arthur Scherbius, successfully mechanized cryptography. His invention, developed over a period from 1918 to 1925, was called Enigma, purportedly after Edward Elgar's musical composition, *Enigma Variations*, in which a variety of melodic 'codes' represented different people. By 1925, the German military had accepted the value of Scherbius's Enigma. Over the course of the war, over 30,000 machines were distrib-

uted to the army, navy and air force.

What exactly was this brainchild? Scherbius's electrically powered encoding machine—with its complex internal design—spat out ciphertext (text altered letter by letter) that was unsolvable by an unwelcome third party. At least that's what Scherbius claimed and, until the end of the war, so did the German military, convinced they had outfoxed the Allies. Actually, the Germans were right. No one should have been able to break the codes enciphered by Enigma—at least not in time for the information to be useful.

## ■ *The Enigma Secret*

**T**o understand why the Germans believed Enigma could never be compromised, it helps to see one of these devices and understand its internal workings. Enigma looks like a complicated typewriter, housed in a wooden box, with a few added gizmos. The basic process is this: the user types in a letter (plaintext) that is then scrambled internally to make a new letter (ciphertext), which shows up on a lighted display board (26 labelled letters positioned over glow lamps) to the rear of the original keyboard. Depressing a key creates a battery-powered electrical impulse inside the machine. This impulse travels through a scrambler to the display board. The genius of Enigma is its complex scrambling process.

Connected to each other and the other components by electrical wires, Enigma's scramblers, called rotors, are hockey puck-sized discs wherein wires, entering at 26

contact points (representing the alphabet) are arranged in random order to exit at 26 different points. A message's plaintext letters keyed in at one end, would emerge on the other side of the rotors transposed and scrambled as ciphertext. So, type in the letter "A," and "M" might be illuminated on the display board. But Scherbius wasn't finished. To eliminate the repetition of ciphertext letters that would result, each time a letter was typed in the rotor would rotate one space (or 1/26) of a revolution. So the next time the sender typed "A" from the plaintext message, it might appear as "Q." The addition of two or three more rotors and the capability for these rotors to be interchanged, further increased the number of possible variations and the complexity of potential decryption.

Messages encrypted by Enigma were decrypted by a second Enigma machine in the hands of the legitimate receiver. The invention of a reflector device, positioned at the end of the sender's scrambling mechanism, allowed the receiver to simply reverse the sender's process to read the message—that is, the receiver could simply type in the ciphertext and the message would follow its own 'footsteps' back to the original plaintext.

As if this was not complicated enough, a receiver Enigma could not decipher the ciphertext unless the order of the rotor discs and the starting position of each rotor were known.

This knowledge was the all-important key. Without it, no message could be deciphered. Scherbius maintained that the number of possible keys was in the billions—which would take years of cryptanalysis to decipher. Add to that the many variations of the scrambler settings and the number rises into the trillions. Further modifications—more rotors and a plug-board, which swapped pairs of letters by the German military, would increase the number of possible key variations into the sextillions. How could a cryptanalyst find one among this astronomical number of possible keys?

## ■ Polish Mathematician Cracks Enigma

**B**letchley Park, home of the British Government Code and Cypher School and the centre of British code breaking during the Second World War, is commonly attributed with breaking the Enigma code. However, it was Biruo Szyfrow, Poland's cipher bureau, where Enigma was first cracked. After the First World War, a newly independent Poland was caught between an ambitious, communist Russia to the east and a still-smarting Germany (from losing territory ceded to Poland) to the west. Hungry for intelligence information on these threatening neighbours, the Biruo recruited mathematicians to ferret out any weakness in the Enigma messages that were beginning to flood the airwaves.

With the help of a German informant, the Poles obtained information that helped them construct replicas of the Enigma machine. By painstaking mathematical analysis that took over a year, Polish cryptographer Marian Rejewski broke Enigma, and for much of the 1930s, the Poles could read the Germans' secret communications.

As the German army began to swell in the mid-1930s, so too did the number of Enigma messages. Enigma security was ramped up with more frequent changes of rotor order within their three slots and the addition of more plugboard cables, accelerating the Polish cryptanalysts' workload. Rejewski's solution to this increased workload was to mechanize the search for the correct scrambler settings, which until then had been accomplished manually. He invented what was basically an adaptation of the Enigma machine and called it a "bombe." Daily, the bombes broke the Enigma keys, allowing the Biruo Szyfrow to read and decipher German messages.

But by January 1939, Enigma's security had been upped once again with the manu-



The Enigma machine in its box.



The rotors.



The power supply.



The selector switch.

facture of two additional rotors (a total now of five different rotors for three slots multiplied the possible number of rotor-order combinations by ten times) plus more plugboard cables. The Biruo Szyfrow didn't have the resources to cope with these new complications and they knew time was running out for Poland. In April, Germany withdrew from its non-aggression pact with Poland. Anti-Polish invective by the Germans was increasing. Having proven Enigma could be broken and knowing Germany would invade any day, the Poles decided to hand over their Enigma secrets to the Allies. On September 1<sup>st</sup>, 1939, just weeks after the Enigma hand-over, Germany invaded Poland and the Second World War began.

## ■ The Allies Take the Secret and Run

**P**olish revelations of their work with Enigma stunned the British and the French. Bletchley Park cryptanalysts had themselves been struggling with the Enigma problem, frustrated by their inability to make any headway. But with the Polish breakthroughs now in their hands, the

British could build on what the Poles had accomplished.

The cryptographic precursor to Bletchley Park, active during the First World War, was known as 'Room 40.' Those cryptanalysts were a collection of linguists and classicists. But, as the Poles had shown, Enigma demanded additional skills: scientists, mathematicians, puzzle solvers and chess players. Alan Turing proved just the sort of person they needed. Only 23 years old in 1935, he had already created a theoretical machine that replicated logical thought using the binary system; this innovation later became the basis for digital computers. Faced with the Enigma challenge, this bright young mathematician ultimately designed a machine that could work out the key from the message itself.

Turing's approach was to search for assumed words, called cribs, within a message. Military communication tended to be standard and repetitious, a weakness he could exploit. Some contents of a ciphertext could thus be predicted from previously deciphered messages. If, for example, messages always began, "Weather

## ►► Ultra intelligence

**Military intelligence decrypted from Italian and Japanese messages, together with intelligence from Enigma, was code named Ultra. Ultra was not only indispensable to winning the Battle of the Atlantic, but to such operations as the evacuation of Dunkirk, success in North Africa, D-Day planning and implementation, and the campaigns in Italy, Midway and others.**

*report for today is ...*", its corresponding ciphertext would essentially hand the cryptanalyst the key: Enigma's rotor and plug-board settings.

But the puzzle was still not solved. One still had to find which rotor combination, out of thousands of possibilities, fit that particular crib. Turing designed a machine to do just that and called it a bombe, in recognition of Rejewski's earlier invention.

In other ways too, German code clerks made the Allies' job of code-cracking easier. Repeating letters, neglecting to turn rotors, sending regular private communications thus giving away locations, and using familiar or repeated sequences for the three-letter key, were all short-cuts that offered the Allies small footholds in the apparently smooth wall of ciphertext. One very obviously bored clerk in North Africa sent out the same message every

day—"Nothing new to report"—which provided code breakers with the crib they needed to figure out that day's key. Bletchley Park's keen-eyed cryptanalysts exploited such seemingly innocent transgressions and, employing Turing's bombes, began to regularly break the codes of German army and air force transmissions.

### ■ *A Battle of Wits in the Atlantic*

**T**he navy, however, was another matter. As the Battle of the Atlantic rolled in favour of one side and back again to the other, the Germans' naval Enigma machines continued to torment Bletchley Park. Highly disciplined, the German naval code operators followed strict protocols, denying Allied cryptanalysts a foothold. Enigma was working as it should. Worse: while the Allies were stumped by the German naval Enigma traffic in the early part of the war, most of their own naval coded

messages were being read by B-Dienst, the German cipher bureau. As German U-boats continued to sink North American supply ships before they could reach her shores, Britain was slowly being strangled.

Bletchley Park was stymied—until the Royal Navy, via carefully controlled boardings of captured German weather ships and U-boats, managed to seize Enigma code books (which specified the daily keys) and even some rotors. Printed with water-soluble ink, all Enigma code books along with the machines, were to be immediately thrown overboard if there was any possibility of capture. Royal Navy crews were diligent in spirited Enigma materials and code books off captured ships without the crews' knowledge, thereby keeping it from the German high command. To persuade the crews all had been lost, the boat would then be scuttled. From June 1941 on, the Allies rerouted convoys past German U-boats and 'wolf packs' based on information they gleaned from their decryptations. Sinkings notably decreased during this period.

In February 1942 the advantage swung back to the Germans as a new Enigma machine containing a fourth rotor slot, was put into service. Bletchley Park was again shut out for ten months—a period the Germans called the 'Happy Times,' as their U-boats went back to sinking Allied ships without much interference. In time, Turing and his team developed new bombes to tackle the four-rotor Enigma. However, it was the capture of more code books from a U-boat in December 1942 that made the difference. Again the advantage swung back to the Allies and by June 1943, the Atlantic supply line to Britain was safe. Moreover, intelligence decrypted from Enigma allowed Allied convoys to locate and attack German fuel supply tankers and ships. The German U-boat fleet never recovered.

For their part, the Allies worked very hard to encourage continued German faith in Enigma. If Enigma intelligence gave them the positions of eight German supply

## ►► Eavesdropping on enemy messages

**Listening stations called 'Y Stations' intercepted enemy messages. Here, operators laboured 24 hours a day in shifts translating intercepted Morse signals into letters at the rate of at least 90 letters per minute. More than 3,000 of these coded messages arrived daily at Bletchley Park, where more than 7,000 men and women also worked shifts around the clock in small wooden or concrete buildings known as 'huts' to decipher Enigma coded messages.**



ships, they would sink only five. Attacks on U-boats were similarly scaled back. To enhance the illusion, spotter planes would be sent out over known U-boat locations, justifying the appearance hours later of Royal Navy destroyers. Fake messages detailing U-boat sightings, sent out for deliberate interception, would logically explain the attacks that followed.

Although the possibility was repeatedly investigated, the Germans never truly believed Enigma had been compromised. So certain were they of Enigma's infallibility that even when the shrewd commander of the U-boat arm, Admiral Karl Dönitz,

suspected communications had been breached, investigators consistently maintained otherwise, blaming everything from bad timing and coincidence to superior enemy tactics. German losses were further attributed to new detection techniques such as the ASDIC sonar system, U-boat detection planes, spies and convoy escort destroyers.

#### ■ *Enigma's Role Remains Enigmatic*

Even today, strategists, tacticians and historians continue to debate the role of secret intelligence in the Allied victory. There is no doubt, however, that Enigma

was a major player in the Battle of the Atlantic. If losing the Battle of the Atlantic meant losing the war, then the Allies' battle with Enigma was a crucial one.

We encourage you to tour the Enigma Exhibit 'now showing' at the Naval Museum of Alberta in celebration of the Canadian Naval Centennial.

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## Operation of the Schlüssel M (Enigma) Machine

The cipher handbook for a particular day directed the operator to select a specific three of eight available rotors, e.g., wheels **A**, **C** and **G**, and place them in the machine slots in a certain wheel order, e.g., **G**, **A** and **C**. The rotors were each 1.27 cm (1/2 in.) wide with serrated rims so that as they sat in their housings with the edges barely visible, the operator's fingers could rotate them manually. As the operator did so, letters of the alphabet inscribed on the rotors would appear consecutively in small round glass holes. The operator then rotated the wheels so they represented that day's settings, e.g., **E**, **L**, **Q**. Next, the handbook prescribed that pairs of connecting plugs resembling those on a telephone switchboard be inserted into specific plug holes, each representing a letter of the alphabet, the usual number of pairings being six to ten.

This completed and the Schlüssel M set for the day, the operator could begin the actual message encrypting. He selected at random three letters to constitute the preambular key, such as **SHB**, which would identify this message as different from all others he might encrypt and transmit on the same day. With this key embedded in the message he 'typed out' the message. As each key engaged—the resistant key action was hard on the fingers, slowing the punching process—a number of permutations took place inside the electromechanical device. For each key (letter) depressed, the right hand rotor advanced one position. Around the rotor rim, 26 to a side, were 52 electrical

contacts. Movement of the rim caused a constantly changing series of current intersections. Once 26 character keys had been punched, the middle rotor, with a completely different wiring pattern, would also begin to advance, adding yet further complexity to the network of electric pulses in Schlüssel M's entrails. In long messages, all three cylinders would be in movement, allowing the machine to encipher 26 x 26 x 26 or 17,576 characters before the cylinders returned to their original positions. By rearranging the selection and order of the cylinders, the possible combinations increased six times to 105,456. Further complicating the route the electric pulses followed were the plugs in the switchboard that operated independently of the mechanical operation in the rest of the machine and provided additional circuits and loops to the tortuous passage of the cipher maze, whose number of possible permutations approached one hundred and fifty million million million, a number maintained by German cipher authorities to be beyond solution. Without knowledge of the day's selection and order of the three rotors, the settings of their rims and the plug pairings, an enemy cryptanalyst, even if he possessed the machine, would face, it was believed, an impossible task making sense of the alphabet gibberish that emerged.

Exactly replicating the keyboard, individual glow holes lit up as the operator punched the keys one by one. If he depressed **M** in the first word of his message, the **R** glow hole might light up, which letter the operator



Enigma in use by the Germans in Dec. 1943.

took down on his pencil pad; when he depressed the second **M** in the first word the **F** hole might glow, and so on as the machine transposed letters in seemingly random fashion. The final step was wireless transmission of the message in its encrypted form. The intended receiver then decrypted the message on an identical machine with the same rotor and plug settings prescribed for that day. The gibberish that the receiver 'typed out' on his machine appeared in the glow holes as understandable German.

The **HYDRA** cipher used by Atlantic boats was originally called **HEIMISCH** (meaning 'home waters') but it is best known in the intelligence literature as **HYDRA**, hence that term's use here. The cipher was known at Bletchley Park as **DOLPHIN**.

**EDITOR'S NOTE** – The preceding was excerpted from the appendices (specifically Appendix C) of the book entitled "Operation Drumbeat: The dramatic story of Germany's first U-boat attacks along the American coast in World War II" by Michael Gannon, Naval Institute Press, Annapolis (1990), pp 425-426.



Seriously, we need your help! If you would like to greet museum visitors one day each month, or if you have at least one day available per week and some computer skills, please call Murray at 403-242-0002!

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