OF photo by Sgt Donald Clark

IN THIS ISSUE:

AND MUCH MORE!

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NOTE TO READERS

As a bilingual journal, readers should take note that where quotations are translated from their original language, we will use the term [Translation] at the end of the quote to indicate that readers can find the original text in the other language version of the *Journal*.

THE CANADIAN
AIR FORCE JOURNAL
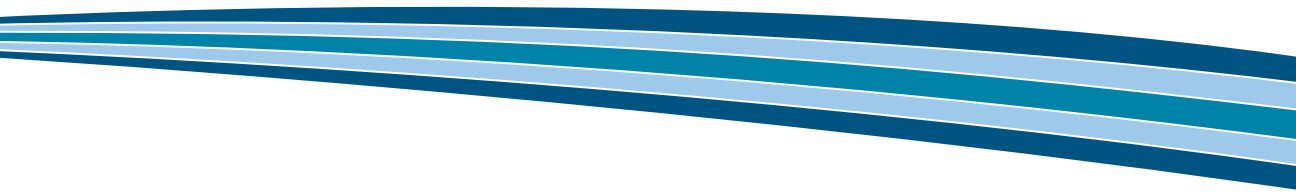
SUBMISSION REQUIREMENTS

THE CANADIAN AIR FORCE JOURNAL welcomes the submission of articles, book reviews and shorter pieces (which will be published in the Letters to the Editor, Points of Interest and Pushing the Envelope sections) that cover the scope of Air Force doctrine, training, leadership, lessons learned and Air Force operations: past, present or future. Submissions on related subjects such as ethics, technology and Air Force history are also invited.

JOURNAL SECTIONS

Item	Word Limit*	Details
Letters to the Editor	50-250	Commentary on any portion of a previous *Journal*.
Articles	3000-5000	Written in academic style.
Book Reviews	500-1000	Written in academic style and must include: • the book's complete title (including sub-title); • the complete names of all authors as presented on the title page; • the book's publisher, including where and when it was published; • the book's ISBN and number of pages; and • a high resolution .jpg file (at least 300 dpi and 5 by 7 inches) of the book's cover.
Points of Interest	250-1000	Information on any topic (including operations, exercises and anniversaries) that is of interest to the broader aerospace audience.
Pushing the Envelope	250-2000	Forum for commentary, opinions and rebuttal on *Journal* articles and/or issues that are of interest to the broader aerospace audience.

* Exclusive of endnotes

AUTHORS ARE ASKED TO NOTE THE FOLLOWING GUIDELINES

- Submissions may be made in either official language.

- Authors must include a brief (one paragraph) biographical sketch which includes current appointment /position, telephone number and email address. Please include all professional and academic designations as well as military decorations.

- Selected articles that have been peer reviewed have a ⊕ to the left of the title or at the beginning of the text of the article.

- The Senior Editor will notify contributors on the status of their submission. It may not be possible to publish all submissions.

- All text submissions must be digital, in Microsoft Word or rich text format. Files must not be password protected and must not contain macros. Files may be submitted by mail or email at the addresses provided below.

- All supporting tables, images and figures that accompany the text should be sent in separate files in the original file format (ie., not imbedded in the text). Original vector files are preferred; high resolution (not less than 300 dpi) .psd or .jpg files may be submitted.

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- Authors should use *Oxford English* or *Petit Robert* spelling. When required, reference notes should be endnotes rather than footnotes and formatted in Chicago style. For assistance refer to *The Little, Brown Handbook, Le guide du rédacteur* or CFAWC Production Section at Francoise.Romard@forces.gc.ca

- Acronyms and abbreviations should be used sparingly:
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  - A list of all abbreviations (and their terms) used in the text will be included at the end of each submission.

- The Senior Editor reserves the right to edit submissions for style, grammar and length, but will not make editorial changes that will affect the integrity of the argument without consulting the author.

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CALL FOR SUBMISSIONS
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DISCLAIMER

IN THIS ISSUE

*A 160th SOAR MH-47 Chinook helicopter, on exercise, stirs up yellow smoke as it prepares to land in Kovachevo, Croatia
US Photo by TSgt Andrew Nystrom*

*A 427 SOAS CH146 Griffon Helicopter prepares to extract rescued journalists in a field on an exercise near Kamloops, BC
CF Photo by Sgt Donald Clark*

EDITOR'S
MESSAGE

Where does the time go? It seems like only yesterday I was pondering what to write in the first *Journal* issue of 2009 and here I am considering what to put in the last issue of the year. Time always seems to go faster when you are busy, so for the Air Force it must be moving at the speed of light. Certainly with the recruiting of new personnel, the acquisition of new equipment, accepting responsibility for Canadian Forces Station Alert and standing up the Wing in Afghanistan, not to mention regular duties and responsibilities, the Air Force has barely had time to catch its breath.

Busy as we all are, I hope that you have time to browse through the contents of the Fall *Journal*. The articles herein take a look at elements of our history, doctrine and culture, as well as "prodding" us to think about how we deal with knowledge and select special operations personnel. I would also like to call your attention to the words of our outgoing and incoming Chief of the Air Staff, respectively, Lieutenant-Generals W. A. Watt and J. P. A. Deschamps, for a "view from the top."

Finally, I want to announce the inaugural edition of a new publication series produced by the Canadian Forces Aerospace Warfare Centre (CFAWC) and dedicated to the study of Canadian aerospace power. The first volume of the *Sic Itur Ad Astra* series contains the papers presented at the 2008 Air Force Historical Workshop, which examined the historical dimensions of Air Force leadership. Subsequent volumes will look at other aerospace and joint subjects, both historical and contemporary, that are of interest to the Air Force. An electronic copy will be available via the CFAWC website, and once printed, a notice will be posted so hardcopies can be requested through the Production Manager, Ms. Anne Pennington.

Major William March, CD, MA
Senior Editor

LETTERS TO THE EDITOR

Ms. Pennington,

My wife and I attended the Anniversary Weekend held at CFB Trenton on July 4, 2009. We were there with the Canadian Aviation Historical Society, which held its Annual General Meeting in Belleville on July 3, 2009. Major Bill March was kind enough to bring our bus in through the passenger entrance at CFB Trenton. As a result, we were able to visit the aircraft and aircrew before the crowds entered around noon. We both thoroughly enjoyed ourselves. I brought my camera equipment and took in the neighbourhood of 1,200 digital pictures of the aircraft on display and in the air.

During the morning we visited the various booths set up in the hangar and I personally learned a great deal speaking with the personnel manning these booths. They were all very polite and so willing to share what information they could. At one of the booths I picked up copies (Volume 1, No. 1, 2, and 3, and Volume 2, No. 1 and 2) of *The Canadian Air Force Journal*. I am very impressed by the quality and the content of these journals.

While I never have served with the Canadian Forces, I do feel a very strong connection to the Air Force. My dad's brother, F/O John J. McGavock, D.F.C., served with 426 Squadron from November 1942 until the end of May 1943. John and his crew were then sent to 1679 Heavy Conversion Unit to convert 425 and 426 Squadron Aircrew from the Wellington to the Lancaster II. Unfortunately, John was killed December 23, 1943 while training a crew.

Neil McGavock

A SELECTION PROCESS FOR
SPECIAL OPERATIONS FORCES AVIATION[1]
IN CANADA

By Lieutenant-Colonel Travis A. Morehen, CD

"When the hour of crisis comes, remember 40 selected men can shake the world."

Yasotay (Mongol Warlord), 1220 AD[2]

PART I The oft-quoted Mongol Warlord Yasotay speaks to a truth that is being rediscovered in today's conflict environment. The truth is that a specifically selected, trained, organized, and equipped group of warriors can make a difference beyond the sum of their individual elements. In the modern era this has been demonstrated by the actions of WWII Allied and Axis special operations forces (SOF), but never so clearly as the actions of coalition SOF in Kuwait (1991), Afghanistan (2001), and Iraq (2003). The actions of SOF during these conflicts have raised the level of academic rigour in the development and utility of special operations (SO) and of SOF.[3]

Typically the analysis of SOF focuses on the forces that are conducting the kinetic destruction of the adversary. One of the supporting elements that enables these forces to accomplish their mission is air or aviation forces that participate in a myriad of tasks and are also capable of conducting independent operations. It has only been recently (post-Afghanistan 2001) that there has been a "boom" in academic and scholarly literature about the development and role of SOF which allowed students to examine the birth of modern SOF aviation and air power in the United States (US). There is also now a breadth of academic works that suggest there is a place for SOF in Canada. The majority of authors invariably start with their definition of SOF and why SOF are considered special. Some scholars suggest it is the mission the soldiers perform while some will say it is the selection of the soldiers themselves that is the differentiation between SOF and conventional forces. Not often written about are the selection criteria and roles of SOF aviation.[4] It is even rarer to find literature dealing with SOF aviation in Canada. Even though Canada has a special operations helicopter squadron under operational command (OPCOM) of Canadian Special Operations Forces Command (CANSOFCOM), there has not yet been any real rigour to develop this capability from a formally supported personnel selection viewpoint.

It is proposed that the personnel who are specifically selected, trained, organized and equipped make the greatest difference, rather than the technology that is given to them. At the heart of most modern and competent SOF are selection programs that identify the men Yasotay desired. Each country takes a slightly different approach to developing their ground and aviation forces, but what is common to America, Britain, Canada and Australia (ABCA) is that there is a selection program for the ground SOF operators.[5] The United States, Britain, and Australia have dedicated air and aviation units to support their SOF forces, with some of these countries having a selection program for those aviation units.

To maximize the effectiveness of aviation support to CANSOFCOM it is imperative that a viable and sustainable SOF aircrew selection model be developed by the Air Force. As of the summer of 2008, there was no formally supported aircrew selection model within the Air Force that met the needs of developing the best possible aviation resources for CANSOFCOM. Currently, aircrew are posted to 427 Special Operations Aviation Squadron (SOAS) without even having to volunteer. Given Canada's projected security requirements it is imperative to allow the best-suited aviators to support CANSOFCOM missions.

Central to the development of this paper are SOF truths penned by retired United States Army Colonel and defence analyst John M. Collins. His study of US and Soviet Special Forces in 1987 led him to develop several enduring SOF truths that have now been enshrined in almost all modern SOF literature.[6] They have become a self-realizing prophecy and have even been used by the US Assistant Secretary of Defense.[7] The four truths most often referred to are: "humans are more important than hardware"; their "quality is more important than quantities"; "SOF cannot be mass produced"; and "competent SOF cannot be created after emergencies occur."[8] A fifth truth that Collins penned, but has not been carried forward, is that "most Special Operations require non-SOF assistance."[9] The development of SOF aviation in Canada has not consistently applied the SOF truths, and therefore, 427 SOAS is not positioned for success. The greatest deficiency facing SOF aviation development in Canada is not adhering to the SOF truth that "quality is more important than quantities."

Troops from the Canadian Special Operations Regiment prepare to rappel from a 427 SOAS CH 146 Griffon helicopter near Kamloops, BC
CF photo by Sgt Donald Clark

ROLES AND TASKS OF CANADIAN SOF AND AVIATION SOF

The CANSOFCOM *Canadian Special Operations Forces Command: An Overview* glossy, provides the most current and most relevant definition for SO, SOF, and missions in a Canadian context. Although not in the doctrinal family of publications, it reads much like the *USSOCOM Fact Book,* as it outlines the mission, key tasks, organization, and operational concepts for CANSOFCOM. Published in 2008, it is the most definitive literature available today that describes the roles and tasks of Canadian SOF. The definition of SOF is consistent with previous concepts outlined so far in this paper. As this paper is being used in a Canadian context, the following CANSOFCOM definition of SOF will be applied throughout the remainder of this thesis:

> Special Operation Forces are organizations containing **specially selected personnel** that are **organized**, **equipped** and **trained** to conduct high-risk, high-value special operations to achieve military, political, economic or informational objectives by using special and unique operational methodologies in hostile, denied, or politically sensitive areas to achieve desired tactical, operational and/or strategic effects in times of peace, conflict, or war.[10]

CANSOFCOM's stated mission is to "… provide the Government of Canada with agile, high-readiness Special Operations Forces capable of conducting special operations across the spectrum of conflict at home and abroad."[11] To achieve the above mission statement, Canadian SOF are organized, equipped, and trained to conduct counterterrorism (CT) operations, maritime CT operations, and high-value tasks (HVT). Examples of HVT are counter-proliferation, special reconnaissance (SR), direct action (DA), and defence diplomacy and military assistance (DDMA). Within *Canadian Special Operations Forces Command: An Overview*, a brief description of each unit is given with their habitually assigned tasks.

Currently, 427 SOAS is the only aviation unit under OPCOM of CANSOFCOM. The 427 SOAS mission statement is to "…provide CANSOFCOM with agile, high-readiness special operations aviation forces capable of conducting special operations across the spectrum of conflict at home and abroad."[12] Specifically, 427 SOAS has supporting roles to play in CT, DA, SR, and DDMA. The unit

provides insertion, extraction, and resupply of SOF using specialty methods which conventional forces are neither trained in nor equipped for.[13] The three common SOF methods of insertion and extraction are by using fast rope, rappelling, and/or low hover techniques. These techniques can be performed day or night in a rural, urban, or maritime environment. In addition to supporting onboard aerial snipers, 427 SOAS aircraft are also able to provide limited direct fire support from crew-served helicopter mounted machine-guns. An enhanced intelligence, surveillance, and reconnaissance capability is also planned. The crews are trained to conduct operations at night and in a chemical, biological, radiological, and nuclear environment. The squadron has an extremely short notice to move requirement in which they can be recalled to plan, mount, and execute an operation.

Further definition of 427 SOAS's roles and missions will be explored as applied to developing a selection process later in the thesis. Ideally, all members of any SOF aviation unit would undergo a selection process but this thesis will only look in detail at the process for the pilots. Contributing aircrew such as flight engineers and mission specialists should be subjected to a similar process.

There is academic thought being placed on the development and employment of SO and SOF in the modern context. This academic literary effort offsets the shelves of picture books and non-fiction commercial works that flood the common view of SO and SOF. The conclusion that can be drawn from the literature review is that the use and development of SOF is at the heart of a country's political and military action policy. SOF gives the government the means to project governmental policy via military means in a high-risk political or military environment. The deployment of a small team of SOF operators to conduct a critical task, can often far outweigh the benefits of sending a large-scale conventional force. SOF by its very nature is designed to be flexible, agile, and responsive to the highest levels of governmental direction. They are equipped with a command structure that is unfettered by conventional military bureaucracy and is directly responsible to the highest levels of the military, and therefore, the government.

The ability for SOF to conduct HVT on behalf of the government is related to how they are specifically selected, trained, equipped, and organized. The literature reviewed offers several viewpoints on what defines SOF from conventional forces, whether it is the missions or the people that make the distinction. General consensus states the human component is the most important. Either it is the specially selected soldier that enables the missions, or it is the missions that determine what type of soldier is chosen. Nonetheless, there are chosen individuals that can shake the world when enabled by technology, training, political will, and freedom of action.

In comparison to the US and the United Kingdom, Canada has a fledgling but rapidly growing SOF capability in terms of international operations. The involvement of Canadian SOF in Afghanistan has brought to the forefront the requirement to educate, shape, and integrate SOF with the CF. The formation of CANSOFCOM has begun the long process to generate the understanding within the CF as to why SOF are different and why a selection process must be instituted. The last domain that needs to "buy in" to the selection process is the Air Force. The roles and tasks for 427 SOAS are clear and consistent with the application of aerospace power in a SO environment. The changing of beret colours from Air Force blue to CANSOFCOM tan was done on a parade in a squadron hangar 1 February 2006. The approximately 250-person-strong squadron transitioned in name and visually into a SO unit but arguably it needs to complete the transformation to SOF unit. There had been subunits within the squadron that had been supporting Joint Task Force Two and Royal Canadian Mounted Police Special Emergency Response Team since their inceptions, but they had never been subjected to a formally supported selection process; the next portion of the article will highlight why such a selection process is required.

WHY SOF SELECTION?

The basis of the definition of SOF as compared to conventional forces or elite forces is often debated. As has been highlighted in the previous chapter, some authors define SOF and SO by the types of missions conducted. The other method for making a distinction is the nature of the selection process and the specific attributes that are desired. In either case, SOF are specially selected, trained, equipped, and organized to conduct high-risk or politically sensitive military operations. Consistent with the theory that SO are economy of force operations, the cost of failure of SO is higher than the cost of SOF selection. This will be argued as the main premise for conducting SOF selection; the husbandry of scarce resources. To complete missions of political and military sensitivity requires that the most suitable personnel undertake those missions.

The cost of failure can be measured through a myriad of methods and categories. Failure can be measured in terms of resources lost in the preparation for or during the conduct of the SO. Resources can further be identified as financial, materiel, and/or personnel. Failure can also be measured in political terms. The inability for the government to have an acceptable outcome to a hostage rescue situation domestically or internationally demonstrates the ultimate goal of the government to protect its citizens has failed. The compromise or failure of a covert mission in another country can cause government embarrassment and degradation in international standing. The SOF operators also have a very personal interest in a robust selection process. Beyond all the military and political overtones, self-survival is a very strong motivator for being surrounded by the most suitable personnel available.

The method that will be used to determine why SOF needs a selection process will be to review the historical basis of selections, a historical case study, and the modern application of selection. The historical basis of selection can be traced back to the First World War (WWI) selection of aircrew. From those roots, selection continued to be used in Second World War (WWII) for covert operatives from the US's Office of Strategic Services (OSS) and Britain's Special Operations Executive during WWII. Selection for conventional aircrew became even more important in WWII. The next section will review the failed 1980 Desert One Iran hostage rescue attempt, as aircrew selection for this SO impacted the planning and conduct of the mission. Finally, a review of current US selection processes will be carried out.

HISTORICAL BASIS

Ironically enough to this paper, it was air forces that started what can be called the first selection process in WWI and WWII. There needed to be a process to determine which were the most likely candidates not only to survive operations, but to survive the training as well. WWI and WWII represented total war and caused great strains on the ability for nations to generate manpower. Efficient methods were required for managing the human resources committed to battle. The requirements for SOF selection, as shall be demonstrated, are not that different from the requirements to develop an aircrew selection process. The historical basis for selection will be looked at from the viewpoint of WWI aircrew, WWII aircrew, and then WWII OSS operators.

RFC cadet group   PD

The doctoral thesis *The Cream of the Crop: A Study of Selection, Training, and Policies Governing Lack of Moral Fibre in Aircrew of the Royal Canadian Air Force* by Dr. Allan English, is a valuable resource for examining the roots of aircrew selection in Canada.[14] As the title suggests, this doctoral thesis covers a broad spectrum of topics with the majority

of this literary effort spent on policies dealing with WWII psychological casualties. But it is English's analysis of the situation in WWI that is particularly helpful for identifying the historical roots of selection. It was not until 1916 that the demand grew for aviators from Canada. The Royal Flying Corps (RFC) in Canada based their selection model on the British model. Aircrew selection at that time was developed with only a nascent understanding of aviation physiology.

The medical professionals that directed the selection thought that "… fliers were individuals with special characteristics that could be identified by means of physical selections."[15] English lists the various standards throughout the war but as a summary, the candidates had to have perfect vision, be under 25 years, be physically strong, have good balance, not be colour blind, possess a measure of recklessness, able to have sufficient education to attend university, and be of European descent.[16] The last measure is the only one that would seem significantly at odds with today's view of physical standards. The prevailing thinking at the time was influenced by social Darwinism and the resulting conclusions that Europeans were a superior race.[17] There were rare exceptions to the European descent rule, but in retrospect, it is indicative of how unsophisticated aircrew selection was at the time.

Rebecca Hancock Cameron's *Training to Fly: Military Flight Training, 1907–1945* presents a similar analysis of the situation facing the United States aviation development efforts.[18] Cameron provides a 1917 quote from General Squier:

> Athletes who are quick witted, punctual and reliable. Intelligent men accustomed to making quick decisions are highly desirable. Men who ride well, can sail a fast boat or handle a motorcycle usually make good air pilots.[19]

When the US instructors visited the RFC Canada facilities, it was emphasized that military discipline was key to becoming a good airman.[20] The US attempted to standardize their selection and training systems but at one point the standardization was criticized by spending too much effort on rushing pilots through training rather than the quality of instruction.[21]

Diane L. Damos published a 2007 report for the U.S. Army Research Institute for the Behavioural Sciences titled *Foundations of Military Pilot Selection Systems: World War I*. In the report, she conducts a literature review to trace the development of the US aircrew selection system. Starting in May 1917, a mental, professional, and oral examination was used to gauge potential indicators of success in training.[22] Damos looked at a 1919 study by V. A. C. Henmon that indicated that 50-60 per cent of applicants were washed out during medical and examination boards. A further 15 per cent were reduced at ground schools and an additional six percent failed because of insufficient flying ability.[23] Henmon went on to measure candidates against suggested tests. The tests that had the highest correlation to flying success measured emotional stability, perception of tilt, and mental alertness.[24]

Damaged Curtiss JN-4A(CAN) aircraft C568 of the Royal Air Force on the roof of a hangar. Library and Archives Canada / PA-102835

The early forays of developing a selection process for specialist soldiers was conceived in the implementation for aircrew selection in WWI. Selection was instituted as a cost saving measure in terms of finances and human lives. This foreshadowing was to rear its head for both the Commonwealth and the US during the early stages of WWII. Still in its infancy, the selection process focused on physical fitness and social station. You had to be fit and you had to be able to learn quickly. It is interesting that the SOF truth "quality is more important

than quantity" could even be applied to aircrew selection from WWI.

The interwar years did little to advance the field of aviation selection. It was not until 1939, when war with Germany was on the horizon, that aircrew selection was modified significantly. The large influx of volunteers as aircrew created a demand for a highly evolved and effective selection system. In *The Cream of the Crop…*, English traces the most important change to aircrew selection since WWI; it was the change from a predominant medical basis for selection to a combined medical psychological basis. As early as 1939, psychologists started having a greater influence on aircrew selection.[25] As such, University of Toronto Psychology department head E. A. Bott was placed in charge of Canadian aircrew selection. In 1939 his plan was to validate aircrew selection so that it would allow him to "… predict those candidates who would cease training (CT); … divide aircrew into categories (i.e., pilot, observer, wireless air gunner); and … reclassify CTs into new aircrew categories."[26] By 1941, there was still a high failure rate of pilot trainees and the RCAF Directorate of Personnel Selection and Research sought answers to rectify the problem. The Navy and Army also had psychologists to support their selection processes, but the RCAF also paid great attention to selection research. As summarized by Douglas Vipond and Ronald A. Richert in "Contributions of Canadian Psychologists to the War Effort: 1939-1945":

> The reason could be that aircrew jobs, in particular, involved quite specialized, distinct types of tasks. A pilot needed abilities different from a gunner, for instance. Therefore it would save money, and even lives, if training was only given to those likely to succeed.[27]

In an address to the American Psychiatric Association in 1942, the president of the RCAF Medical Reselection Board, Wing Commander Mitchell, presented the challenges that were facing the RCAF at the time. Mitchell identified physical and educational as the most

Trainees with North American "Harvard" Aircraft, No. 14 Service Flying Training School, R.C.A.F, 1942.
Library and Archives Canada / C-000717

important standards for selection but acknowledged that they are not the only indicators of potential success.[28] The personality make-up of the candidate must also be assessed with a high requisite degree of maturity and discipline. Mitchell identified that the crewmember may not be acting alone and that,

> …an immature, irresponsible lad might, like the weakest link in the chain, be that cause of the loss of a valuable aircraft and the death not only of himself but also the other members of his crew.[29]

Additional personality traits for analysis include morbid fears, physiological instability, traits of timidity and unaggressiveness, other kinds of nervousness, and volitional disorders.[30]

The development of a psychologically-based selection process was not limited to WWII aircrew. The US Office of Strategic Services during WWII was responsible for covert and clandestine actions during WWII. It was an intelligence agency, a research organization, a training school for saboteurs and

Link trainer, Royal Canadian Air Force Station. Canada. Department of National Defence / Library and Archives Canada / PA-136268

resistance networks, and directed sabotage and destruction behind enemy lines.[31] To carry out this breadth of activities, there were requisite skills required that could not easily be found in civilians or conventional military forces. In 1943, the head of the OSS, General Donovan, directed that a psychological-physiological assessment unit be formed to select agents for OSS duty. Written in 1949 by OSS Assessment Staff, the book *Assessment of Men* describes the history and the method of selection of OSS operatives. The book describes the assessment of men as "…the scientific art of arriving at sufficient conclusions from insufficient data."[32] As with previously mentioned selection processes, it was designed to weed out the unfit and select those best suited for any number of different jobs.

Constrained by time and resources, one of the key influences in determining the type of selection process the OSS could use was the myriad of jobs and tasks those operatives would be tasked to perform. It was near impossible for an accurate job description to be linked directly to the assessment process. The conventional job-task-analysis approach used to date would not work. Another factor in the selection process was—due to the exigencies of war—that there was no time to develop a true in-depth analysis of personality theories and how they would apply to the task to be tested. Instead, the assessment staff made some general assumptions about personalities and rationalized their theories. Rather than an assessment of a specific task, the OSS based its selection on a group of general traits. The general variables that were chosen as attributes comprised the following: motivation for assignment, energy

and initiative, effective intelligence, emotional stability, social relations, leadership, security, physical ability, observing and reporting, and propaganda skills.[33] *Assessment of Men* continues to this day to be a fundamental benchmark in the development of clinical psychology and in the selection of SOF. The general traits identified in the mid-forties for covert operatives can be linked to modern day SOF criteria.

Examination of WWI aircrew, WWII aircrew, and WWII OSS selection processes has identified the genesis of the modern selection process. A selection process is designed to predict those candidates that have the greatest chance of success in training and therefore subsequent operations. Failure to select the most suited candidates can lead to financial or personnel training wastage or unnecessary combat losses. As combat systems have evolved technologically and soldiers are given greater responsibility (i.e., covert operations in a foreign country) this effect can be compounded. Equally important are the contributions of a wide range of medical disciplines to structure a valid selection process for the tasks that are required to be performed.

HISTORICAL CASE STUDY

The following historical case study of SO highlights the importance of SOF selection. The case study to be reviewed will be the failed 1980 US hostage rescue in Iran.

The failure of Operation *Eagle Claw* was pivotal in the reshaping of the SO community in the US. Operation *Eagle Claw* was a joint special forces operation to rescue American hostages in Tehran. In April of 1980, a rescue force of eight RH-54D helicopters, SOF soldiers, and an element of C130 Hercules landed inside Iran at a secluded desert site known as Desert One. Desert One was a staging area for refuelling of the helicopters and the trans-loading of the SOF rescue team from the fixed-wing transports to the helicopters. Due to helicopter serviceability problems at Desert One, there were insufficient helicopters to continue and therefore the mission was aborted.

During the refuelling procedures for the return trip, a helicopter accidently hover taxied into a C130 tanker due to loss of visibility caused by blowing dust and night-time conditions. The resulting crash and subsequent fire required the rescue force to conduct an immediate evacuation of the area and to proceed to recovery locations outside of Iran.[34] Five RH-53D helicopters were abandoned, with one RH-53D and one C130 Hercules left burning. Eight servicemen died with some of the bodies having to be left in the burning wreckage. This incident caused great embarrassment to the US military and the government.[35]

Operation Eagle Claw: *Crash site at* Desert One
DoD photo, USA

The "Holloway Report" was commissioned by the US Joint Chiefs of Staff to investigate the planning, organization, training, and execution of the mission in order to improve future performance. Inside the report are conclusions and recommendations that led to the formation of a dedicated counterterrorist joint task force panel and a Special Operations Advisory Panel. As a result of pressures to reform the US military and specifically the special operations community, the Nunn-Cohen Act and the Goldwater-Nichols Act restructured the US military and ultimately led to the formation of combatant commands and United States Special Operations Command (USSOCOM).[36]

The Holloway Report and other literature related to the failure at Desert One is a classical case study to analyse the SOF truths. Although the report clearly states that not one single factor caused the mission to fail, it highlights areas where "risk might have been better managed."[37] Two issues that were not found to be pivotal to the failure of the mission, but were examined for risk mitigation, were the selection of the RH-53D helicopters and the crews that flew them.

The helicopters for the mission were going to be launched from the aircraft carrier USS *Nimitz* and required a balanced combination of range, payload, shipboard compatibility, and operational security (OPSEC). The RH-53D helicopter was chosen because it was the best solution of all the available helicopters.[38] The decision in which crews were going to be used

was a result of the desire to retain unit integrity and maintain OPSEC. Since the RH-53D was a minesweeping helicopter, it was initially decided to use Navy crews, as the full details of the mission were not provided to subordinate planners.[39] Because the Navy crews were not experienced in overland operations, US Marine Corps H-53 pilots would round out the crews to bring experience. Colonel James L. Kyle was the Air Force and Desert One on-scene commander. In his book *The Guts to Try*, Kyle indicates he tried on several occasions to press forward the idea to get Air Force pilots with H-53 experience and SO backgrounds from Vietnam to fly the RH-53Ds.[40] It is suggested that OPSEC played a part in the decision not to grab these experienced pilots, as they were spread out and their disappearance would be noticed. Kyle states:

> My concern was that we select the best people for the job, and I suspected that the navy pilots had little, if any, experience operating in the desert, or on night low-level, long range, deep-penetration missions into hostile territory.[41]

The Navy pilots were not accustomed to flying on night vision goggles (NVG) or flying in tight formation. They were also not trained in low-level tactical flying. The Navy pilots in particular found the training challenging, as they were used to towing minesweeping equipment in straight lines through the water. To further complicate matters, the tactics the Navy was using were not authorized the way they would have been for the Air Force Special Operations crews. At one point in the training, the Delta Force commander Colonel Beckwith expressed

serious concerns over the pilots' ability to fly the mission. A psychologist who examined the Navy pilots remarked:

> You know, we got some guys here who are really shaky. They're beginning to understand what kind of mission you want them to fly. Sure, one or two might make it, but for the rest….[42]

Beckwith commented on one particular Navy pilot after he quit flying due to fear; "I understood [he was scared]. But quitting. That was something else. He'd lost his motivation, his objectivity, and his desire. He'd also lost his balls."[43] As a result some of the Navy pilots were replaced with more experienced Marine pilots.

The "Holloway Report" identifies that the United States Air Force (USAF) had approximately 100 H-53 pilots who were current and qualified in long-range missions. It also identifies that approximately another 80 former qualified H-53 pilots that had "… recent [SOF] or rescue experience."[44] The report addresses the question of whether it would have been easier for the USAF H-53 pilots to learn to fly the RH-53Ds from the carrier, or if it would have been easier for the Navy and Marine RH-53D crews to learn SOF and rescue operations. The report indicates that based on the experience from USAF advisors training Vietnamese pilots during the Vietnam war, that "learning new and vastly different complex mission skills is far more difficult to transitioning to an aircraft of similar design and performance characteristics."[45] The report concludes its evaluation of this issue by indicating "the importance of designating an operational helicopter unit responsible for maintaining mission capability in this area."[46]

The use of the Operation *Eagle Claw* case study is not meant to be an analysis of why the mission failed. It is used instead to identify that in the case of SOF selection, the right personnel need to be selected for the right job. The Navy and arguably the Marine pilots did not have the requisite skills or potential attributes that afforded the best chance for risk mitigation. The availability of previous SOF

and rescue pilots with H-53 experience should have been exploited. In the SOF community it is imperative that operators and supporters are able to trust each other implicitly with their lives. By not selecting the right individuals to competently conduct training or operations, operations can be adversely affected when a supported unit refuses to fly with the supporting aviation unit. Lastly, it is evident that competent SOF organizations cannot be expected to be created after an emergency occurs. The planning and training for Operation *Eagle Claw* lasted five and half months. What would have happened if the situation in Tehran had not allowed for that amount of time to prepare? The mission may still have been executed with less skilled crews inviting greater risk, or the mission may not have gone at all, thereby putting the hostages at risk. The price of failure was high in terms of aircraft, lives lost, and prestige of the US military and government.

A second hostage rescue team was formed under Operation *Honey Badger*. This time Air Force and Army aviation units were identified to support the operation. The plan was never put into action, as the hostages were released in January of 1981. The already generated aviation task forces expected to be disbanded but they were retained and formed the genesis of TF 160, which was to eventually become the 160th Special Operations Aviation Regiment (A).[47] The 160th would develop demanding selection criteria to become the most capable SO helicopter unit in the world.

MODERN ALLIED APPLICATION

The process of selection has advanced significantly since WWI and WWII. The addition of clinical psychologists has greatly enhanced the ability of selection staff to fit personnel where they are best suited. The aircrew selection process of WWI and WWII is an example of identifying personnel from civilian life into service of the armed services. Selection for SOF is a process above and beyond the process required to gain entry into an individual's initial trade qualifications. Some critics of the process for SOF aircrew selection may suggest that due to the highly demanding nature of aircrew selection,

there is no further requirement for SOF selection. If a pilot has his wings then he is "good to go," but like most SOF, a SOF aviator requires specialized skills, traits, and qualities. To demonstrate, selection processes from the US Green Berets and the 160th SOAR (A) will be examined. The US Green Beret program has the most extensive literature written on the subject and the selection process for the 160th SOAR (A) is the most applicable to the topic of this thesis.

In general, there are three phases that a SOF candidate must go through to become a "badged" member of a SOF organization.[48] The first phase is screening, followed by selection, and then training. The screening phase allows potential candidates to perform the first form of selection; self-selection. Self-selection starts with recruiting, as modern recruiting is overt and much publicized. SOF organizations actively conduct briefings to inform potential candidates of the tasks, missions, and requirements of the SOF unit. This process allows a candidate to understand the personal and professional requirements of applying for a SOF unit. As Vice-Admiral William H. McRaven,[49] the OSS Assessment Team, and Colonel Beckwith have identified, a candidate's high degree of motivation is key to becoming an effective member of a specialized team. A high degree of motivation permits the individuals to push themselves beyond their mental and physical limits. The culmination of the recruiting is for candidates to volunteer knowing as much as OPSEC will allow about the training and mission requirements. In general terms, as long as candidates are volunteers and have met the screening criteria, they are offered a chance at selection.

The US Special Forces are more commonly known as the Green Berets and their screening, selection, and training process are the subject of extensive literature.
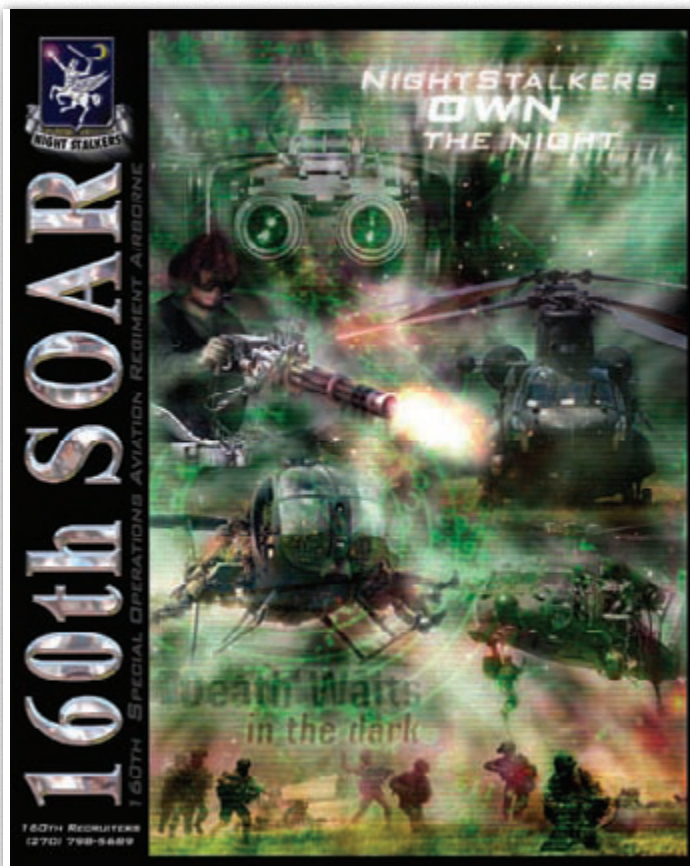
It is for that reason their process will be examined. The Green Berets have a long and proud heritage that was created out of the requirement to conduct unconventional or irregular warfare.[50] Today they fall under USSOCOM and are considered part of the broader SOF community.[51] Many of their tasks fall within the USSOCOM mission sets and as such that have created a robust selection process that has evolved over the years. Borne out of a requirement to save training resources, the original Special Forces Assessment and Selection Course (SFAS) was designed to "assess volunteers' motivation, mental and physical condition and ability to work as members of a team."[52]

Candidates do not pass or fail SFAS, but the selection process is a method in which the staff selects which candidates will have the greatest chance of success in completing the

Green Berets
US Photo by TSgt Maria L. Taylor

Special Forces Qualification Course (SFQC). Previous to the implementation of SFAS, the selection process was embedded into the training program. This practice was costly as there was the potential for extensive resources to be spent on a low probability candidate. In 1990, the first officer in charge of the SFAS program, Major Velky, wrote the program looked for "volunteers [to] demonstrate the following traits: physical fitness, motivation, intelligence, responsibility, stability, trustworthiness, sociability, [and] leadership."[53] Velky acknowledges that all "good soldiers" in the Army should have these attributes, but that due to the nature of SO, they are neither tested nor observed in ambiguous stressful situations. SFAS was meant to assess a volunteer's personality traits and qualities by using a multitude of personality tests in addition to field assessments.

The US Army Recruiting Command Pamphlet 601-25 "In-Service Special Forces Recruiting Program (Officer and Enlisted)" provides the latest requirements on how to apply and what to expect during SF assessment, training, and assignment. Within the pamphlet, the criteria prior to selection to attend SFAS are described in terms of minimum physical fitness, security clearance, time in service, medical standard requirements, application letters and so forth. The pamphlet even goes so far as to detail a kit list, a pre-course physical training program, and provides tips to pass the course.

At time of the 2006 publication of Pamphlet 601-25, SFAS has become a four-week selection process that "…assesses each candidate for six attributes that are important for all Special Forces Soldiers."[54] The attributes that are assessed have only changed slightly from 1990. Pamphlet 601-25 states them as intelligence, trainability, physical fitness, motivation, influence, and judgement.[55] SFAS is a four-week course run at the John F. Kennedy Special Warfare Center and School at Fort Bragg, North Carolina. Week one comprises the following: in-processing, Army Physical Fitness Test, swim assessment, rucksack marches, run assessments, medical briefing, education tests, the Minnesota Multiphasic Personality Inventory, and language aptitude testing. Week two involves land navigation, map reading, compass course, land navigation practical exercise, and land navigation exams. Week three assessments include team events, and long-range movement. Week four has out-counselling, the selection

board, selection ceremony, security interviews, and out-processing. The assessments are designed to place the candidates under mental and physical stress in a neutral environment. No performance feedback is given to the candidates so that they are encouraged to do their best at all times.[56]

Normally all SOF personnel are recruited from existing serving members of the Armed Forces but the US Army SOC has created a unique Special Forces Candidate 18X program.[57] The 18X program allows a recruit to come in off the street and after successful basic and advanced infantry training proceed to SFAS for a guaranteed SF "try-out."[58] It does not guarantee that a new recruit may be selected to become a Green Beret, but with the current high demand for SOF, the program significantly increases the recruiting pool in which to draw from. If normal or 18X candidates are selected from SFAS, they then proceed to the SFQC which comprises five more phases of training lasting approximately two years, including language training. SF candidates are only on temporary duty during SFAS and are not posted from their parent units until they are selected for the SFQC. Once they have completed the SFQC, the Green Berets are then posted to their operational unit for employment.

The selection for the 160th SOAR (A) is similar in many respects to the SFAS program. There is not as much literature published on the detailed nature of the selection process but there is enough to gather a feel for the program.[59] In the early days of the 160th, it was shrouded in secrecy and one could only apply after being recommended by a former or serving member. Partially as a result of secrecy and lack of oversight, a 1983 panel investigated a significant increase in aircraft accident rates with the 160th SOAR (A). In its first three years, the 160th had nine accidents and 21 deaths.[60] Because the 160th SOAR (A) was using cutting edge experimental equipment and tactics in order to "get the job done," the panel found that there was an absence of adequate training and doctrine standards. A dedicated training

organization was established called "Green Platoon" that gave extensive training before allowing aircrew to become mission qualified.[61]

Green Platoon has evolved into the Special Operations Aviation Training Company, but is still commonly referred to as Green Platoon. The USASOC 160th SOAR (A) fact sheet now openly states that the 160th SOAR (A) "actively seeks and assesses the best-qualified aviators, crew members, and support personnel in the Army."[62] Officer and enlisted candidates can now fill out applications online as part of the initial screening process.[63] All commissioned and warrant officers are required to be volunteers. Enlisted support trades may be posted without volunteering to go to the 160th SOAR (A) but they are not forced to stay if they do not want to.[64]

As with SFAS there are two main phases in assessment and selection. The first is a pre-screening and detailed records review of the candidates. The second stage is an assessment week. The assessment week comprises a fitness and swim test, a psychological evaluation, a flight evaluation, and a formal board interview.[65] If the candidate is selected, they then commence Green Platoon training. Chief Warrant Officer Michael Durant recounts in his book, *In the Company of Heroes*, his experiences when applying for a position at the 160th SOAR (A) in 1988:

> If you didn't have the patience, perseverance, determination, and nerve, the 160th SOAR (A) was not for you. You would be constantly honing your skills, improving, improvising, developing new techniques. You had to fly right and shoot straight, 24/7. You had to be cool under fire, take harsh criticism, and offer it constructively. The unit's motto, "Night Stalkers Don't Quit," and its mission, "Time-on-Target plus or minus thirty seconds," had to seep into every aspect of your life. It was the ultimate team effort, but every member of the team had to have the skills of the quarterback, the grit of a linebacker, and the brains of a coach.[66]

The assessment phase is consistent with the philosophy of only sending to training the personnel that have the correct personality traits/qualities that will fit the potential mission profiles, and have the aptitude to succeed in training. Once assessment is complete, officer and enlisted personnel are sent on two different streams of training. The enlisted stream is five weeks of training that will teach hand-to-hand combat, advanced first-aid, pistol and rifle qualifications, land navigation, water-survival training, and other combat-related tasks.[67] The Green Platoon training for the officers/aviators can be between three and 24 weeks. The length of training will depend on previous aircraft qualifications and will bring the aircrew to a basic military qualification on their assigned aircraft. The training consists of four phases: phase one is survival, escape/evasion, resistance and extraction training; phase two is combat skills training similar to the enlisted program; phase three is an intensive NVG training program; and phase four is aircraft specific training.[68] Candidates are not fully accepted into the unit until they pass this phase of training.

Through the selection process of the US Green Berets and the 160th SOAR(A), the best suited individuals that have the greatest chance of passing training and surviving combat are chosen. These selection processes, like those of WWI and WWII, have been a result of unacceptable losses of training resources as well as human lives. Both processes embrace the SOF truths that "humans are more important than hardware"; "quality is more important than quantity"; and "competent SOF can not be created after emergencies occur."

CONCLUSION

The previous section highlighted the origins of a selection process. Selection was designed to save financial and personnel resources. The effectiveness of a selection process can be measured using various methods. Strict financial accounting is probably the easiest and the most tangible. Of course, the greater number of poor candidates that you remove from the program earlier, the more potential savings are realized. The financial equation can become more complicated when you calculate the potential loss of an aircraft and/or other resources.

The equation elevates to a theoretical construct when the cost of a soldier's life is added. Financial implications can be compounded when an entire crewed aircraft or squad of SOF soldiers is lost due to an individual's mistake or unsuitableness. If the mission is vital to national security and is of a high-risk politically, damage to a nation's status in the world is almost incalculable and could potentially lead to the fall of a government. Conversely, it is very hard to measure the successful outcomes of a selection program. How many lives were saved because the most suited soldier or aircrew accomplished their mission? How often has the government been saved embarrassment because competent SOF were able to achieve their mission or had the sense not to attempt the unachievable?

The selection processes for the Green Berets and the 160th SOAR (A) are indicative of processes used by modern SOF units. Research is understandably limited by security classification of the processes, but even anecdotal and paperback non-fiction relates that there are screening, assessment/selection, and training phases for other SOF units in other countries. Modern SOF organizations conduct a selection process that focuses on more than just technical skills and minimum physical requirements. At some degree in defining the appropriate selection process there has to be a differentiation in the identification of the technical skills and the non-technical traits or qualities required to do the mission. The technical skills can be defined as being a "good-stick" or an "excellent shot" and the non-technical traits are those such as leadership ability, motivation, intelligence, judgement, and sociability. By selecting the personnel who have the best fit to conduct high-risk operations, SOF remains an economy of force option. The risk to complete the mission is mitigated as much as possible from a human standpoint.

To become a military aviator there is already a screening, assessment, and training program in

place. When pilots receive their wings it signifies that they have achieved a standard that is acceptable for employment in the Air Force; however, this does not automatically grant them the ability to be SOF aviators. They may possess the desired attributes and aptitudes for SOF employment, but in order to further reduce the risk of failure in training or operations, SOF aviators must be selected just as if they were clearing a house of terrorists or saving a hostage. The measures and means may be different, but the process needs to produce the same outcome; a quality SOF operator capable of conducting sensitive high-risk missions under extreme stress and with little supervision. The Desert One case study amply demonstrates this point as well as indicating this process must take place before those forces are required. Canada can ill-afford to attempt to produce quality SOF aviators at the time of crisis, it would be too late. The current lack of a formally supported selection process for SOF aviators places potential resources and lives at risk. ∎

List of Abbreviations

CANSOFCOM	Canadian Special Operations Forces Command
CPA	Canadian Psychological Association
CT	cease training
CT	counterterrorism
DA	direct action
DDMA	defence diplomacy and military assistance
HVT	high value tasks
NVG	night vision goggles
OPCOM	operational command
OPSEC	operational security
OSS	Office of Strategic Services
RFC	Royal Flying Corps
SF	special forces
SFQC	Special Forces Qualification Course
SOAS	Special Operations Aviation Squadron
SO	special operations
SOF	special operations forces
SR	special reconnaissance
US	United States
USSOCOM	United States Special Operations Command

A graduate of Royal Roads Military College, Lieutenant-Colonel Travis Morehen received his pilot wings in November 1995, subsequently serving with 427 Tactical Helicopter Squadron, Petawawa, and at 1 Wing Headquarters, Kingston, with tours in Bosnia, Haiti and Afghanistan. In 2005 as a flight commander and operations officer, he assisted in the transition of 427 to a Special Operations Aviation Squadron. Graduating from Canadian Forces College, Toronto, in 2009, he is currently employed as the A3 Tactical Aviation at 1 Canadian Air Division, Winnipeg.

Notes

1. There are minor differences in various organizations' or institutions' definitions of SOF, but the most common thread throughout the presented literature is that SOF are specially selected, equipped, and trained forces to conduct high-risk missions that conventional forces are normally unable to perform.

2. Most recently quoted in James, D. Kiras, *Special Operations Strategy: From World War II to the War on Terrorism* (London; New York: Routledge, 2006), xii.

3. SO is the task or effect that is to be achieved, whilst SOF or special forces (SF) are the personnel that conduct the task or achieve the effect. There is no internationally agreed differentiation between the terms SOF

and SF. The United States use both terms to describe the activities of different units. For the purpose of this paper, SOF will be used to denote SF or SOF.

4. Within doctrine, "aviation" commonly refers to rotary wing platforms, while "air" refers to fixed-wing platforms. Throughout this thesis, aviation will refer to generic air platforms unless specifically indicated.

5. "Operator" typically refers to the personnel that carry out the primary functions of the SOF unit as compared to "supporter," which enables the operator. In the case of an aviation unit, operators would typically be the aircrew with technicians being the supporters.

6. John M. Collins, *United States and Soviet Special Operations: A Study*. (Washington: General Publishing Office, 1987). Also commercially published as *Green Berets, Seals, and Spetsnaz: U.S. and Soviet special military operations. (*Washington: Pergamon-Brassey's, 1987).

7. Thomas W. O'Connell, Assistant Secretary of Defense Special Operations / Low-Intensity Conflict, *Testimony Before the Senate Armed Services Subcommittee on Emerging Threats and Capabilities,* 5 April 2006.

8. John M. Collins, "U.S. Special Operations – Personal Opinions," (lecture 1st Special Warfare Training Group, Camp Mackall, NC, 11 December 2008); available online at http://smallwarsjournal.com/mag/docs-temp/148-collins.pdf (accessed February 23, 2008). Collins writes that if he had to start over he would modify the fourth to read "Competent SOF cannot be created RAPIDLY after emergencies occur."

9. Collins, "U.S. Special Operations – Personal Opinions."

10. Department of National Defence (DND), *Canadian Special Operations Forces Command: An Overview* (Ottawa: DND Canada, 2008), 3. Bolded emphasis added.

11. Ibid., 8.

12. Ibid., 11.

13. The author was a Flight Commander and Squadron Operations Officer at 427 SOAS from 2005-2008. The capabilities listed here are described in general terms due to the classified nature of the tactics, techniques, and procedures.

14. Allan D. English, *The Cream of the Crop: A Study of Selection, Training, and Policies Governing the Lack of Moral Fibre in Aircrew of the Royal Canadian Air Force* (Kingston, ON: Queen's University Doctoral Thesis, 1993).

15. Ibid., 39.

16. Ibid., 41-47.

17. Ibid., 46.

18. Rebecca Hancock Cameron, *Training to Fly: Military Flight Training, 1907-1945* (Washington: United States Government Printing Office, 1999), 71-73. Between 1914 and 1918, the aviation training programs in the United States were operated under the Air Service in the Signal Corps.

19. Telegram from General Squier to President of Harvard University, 5 June, 1917, Robert Lowell Papers; as quoted in Rebecca Hancock Cameron, *Training to Fly: Military Flight Training, 1907-1945* (Washington: United States Government Printing Office, 1999), 114.

20. Ibid., 116.

21. Ibid., 127.

22. Diane L. Damos, *Foundations of Military Pilot Selection Systems: World War I* Technical Report 1210, prepared for the US Army Research Institute for the Behavioral and Social Sciences (Arlington, VA: US Army Research Institute, 2007), 9. Available online at http://www.hqda.army.mil/ari/pdf/TR1210.pdf (accessed April 4, 2009).

23. V. A. C. Henmon, "Air Service Tests of Aptitude for Flying," *The Journal of Applied Psychology* 3, no.2 (June 1919), 104; Available online at http://web.ebscohost.com/ehost/pdf?vid=8&hid=106&sid=b8a1609d-db7d-4297-a48d-9020a4f7510a%40sessionmgr109 (accessed April 4, 2009).

24. Ibid., 107.

25. English, *The Cream of the Crop…*, 60.

26. Ibid., 61. For a detailed description of the formation of the Canadian Psychological Association (CPA) as a result of WWII see Mary J. Wright, "CPA: The First Ten Years," *The Canadian Psychologist* 15, no. 2 (April 1974). Available online at http://web.ebscohost.com/ehost/pdf?vid=1&hid=105&sid=80963a87-d20f-4513-8151-118a59a407be%40sessionmgr109 (accessed April 4, 2009).

27. Douglas Vipond, and Ronald A. Richert, "Contributions of Canadian Psychologists to the War Effort: 1939-1945," *Canadian Psychological Review* 19, no. 2 (April 1977), 171. Available online at http://web.ebscohost.com/ehost/pdf?vid=4&hid=115&sid=632e0cf1-238f-407c-b104-4949d1d3a7ac%40sessionmgr107 (accessed April 4, 2009).

28. H. D. Mitchell, "Aircrew Selection," *The American Journal of Psychiatry* 99, 354 (November 1942). Available online at http://ajp.psychiatryonline.org/cgi/pdf_extract/99/3/354 (accessed February 26, 2009).

29. Ibid., 356.

30. Ibid.

31. OSS Assessment Staff, *Assessment of Men: Selection of Personnel for the Office of Strategic Services* (New York: Rinehart & Company, 1948), 10.

32. Ibid., 8.

33. Ibid., 31.

34. United States, "The Holloway Report," (Department of Defense, 1980), 9-10. Available online at http://www.gwu.edu/~nsarchiv/NSAEBB/NSAEBB63/doc8.pdf (accessed January 28, 2009).

35. Orr Kelly, *From a Dark Sky: the Story of U.S. Air Force Special Operations* (Novato, CA: Presidio Press, 1996), 248-249.

36. US Special Operations Command, *United States Special Operations Command History, 20ᵗʰ Anniversary Edition: 1987-2007* (MacDill AFB, Florida: USSOCOM History and Research and History Office, 2007), 5-7.

37. "The Holloway Report," 12.

38. Ibid., 32.

39. James L. Kyle, *The Guts to Try* (New York: Orion Books, 1990), 59. Col Kyle was the Air Force Commander of the mission and the on-scene commander at Desert One.

40. Ibid., 120.

41. Ibid., 59-60.

42. Charlie A. Beckwith and Donald Knox, *Delta Force* (New York: Harcourt Brace Jovanovish, 1983), 224.

43. Ibid.

44. "The Holloway Report," 35.

45. Ibid. The USAF training mission in Vietnam in 1961 was known as the Jungle Jim Project. For more on Jungle Jim see Orr Kelly, *From a Dark Sky: the Story of U.S. Air Force Special Operations*, (Novato, CA: Presidio Press, 1996), Chapter 14 "They Called it Jungle Jim." The pilots for Jungle Jim had to undergo an advanced selection process before going to Vietnam, including "quitting from the Armed Forces."

46. "The Holloway Report," 36.

47. Fred J. Pushies, *Night Stalkers: 160ᵗʰ Special Operations Aviation Regiment* (St. Paul, MN: Zenith Press, 1995), 15-16.

48. "Badged" means having successfully completed selection and training and signifies acceptance into the organization. There is usually a formal or semi-formal ceremony where SOF are given their distinctive headdress or uniform insignia.

49. William H. McRaven, *Spec Ops: Case Studies in Special Operations Warfare: Theory and Practice* (Novato, CA: Presidio, 1995). Written by the current US Joint Special Operations Command Commander, this book is viewed as one of the standard and encompassing SO theory books available. McRaven uses eight case studies to present an original theory of SO. His theory states that for special forces operations to succeed, they must achieve and maintain relative superiority. Not based on firepower alone, relative superiority is achieved by reducing the friction of war by executing a simple plan which is "carefully concealed, repeatedly and realistically rehearsed, and executed with surprise, speed, and purpose."

50. USSOCOM Public Affairs, *USSOCOM Fact Book 2009,* 12.

51. The Green Berets have been traditionally known as special forces, but in the current context the lines have been blurred between SF and SOF. SOF has now become the common description to include SF.

52. James R. Fricke, "The Special Forces Q-Course," *Special Warfare* 3, no. 1 (Winter 1990), 4. Available online at http://www.soc.mil/swcs/swmag/90win.pdf (accessed April 1, 2009).

53. James A. Velky, "Special Forces Assessment and Selection," *Special Warfare* 3, no. 1 (Winter 1990), 14. Available online at http://www.soc.mil/swcs/swmag/90win.pdf (accessed April 1, 2009).

54. US Army Recruiting Command Pamphlet 601-25, "In-Service Special Forces Recruiting Program (Officer and Enlisted)," 14 November 2006, 4. Available online at http://www.agd.state.tx.us/RR/documents/Special Forces-USAREC-Pam-601-25.pdf (accessed January 27, 2009).

55. Ibid.

56. Ibid.

57. In the US, military occupational specialties are given alphanumeric codes to describe the basic task of the soldier. The 18 series identifies Green Berets with an alpha character to identify which trade, 18A is SF Detachment Commander, 18B SF Weapons Sergeant, and so on.

58. US Army, "Careers & Jobs, Special Forces Candidate 18(X)." Available online at http://www.goarmy.com/JobDetail.do?id=344 (accessed April 14, 2009).

59. In the spring of 2005, the author visited the 160th SOAR (A) at Fort Campbell, KY and was briefed on the selection and training process of the 160th SOAR (A). This included a briefing about Green Platoon.

60. USASOC, "Without Equal: The Story of Army Special Operations," available online at http://www.soc.mil/sofinfo/story.html#sp08 (accessed September 14, 2009).

61. Carl R. Brown, "'Green Platoon': The 160th SOAR's training program," *Special Warfare* 14, no. 3 (Summer 2001), 12. Available online at http://proquest.umi.com/pqdweb?sid=1&vinst=PROD&fmt=6&startpage=-1&clientid=417&vname=PQD&RQT=309&did=92354679&scaling=FULL&vtype=PQD&rqt=309&TS=1235199112&clientId=417 (accessed February 21, 2009).

62. USSOCOM, "160th Special Operations Aviation Fact Sheet," available online at http://news.soc.mil/factsheets/160th%20fact%20sheet.pdf; (accessed February 27, 2009).

63. 160th SOAR (A) Recruiting, available online at http://www.campbell.army.mil/newinternet/UnitPages/SpecialForces/160recruiters.htm (accessed March 30, 2009).

64. Pushies, *Night Stalkers…*, 64.

65. Ibid., 64-65.

66. Michael J. Durant and Steven Hartov, *In the Company of Heroes* (New York: G.P. Putnam's Sons, 2003), 149. Durant has became famous as a result of being the 160th SOAR(A) pilot in Somali captivity. He was shot down in Mogadishu, Somalia in October 1993. Based on the events of the shoot down and attempted rescue, the Mark Bowden book *Blackhawk Down* was made into a major motion picture.

67. Walt Sokalski, "Learning to SOAR," *Soldiers* 53, no. 12 (December 1998), 28-29. Available online at http://proquest.umi.com/pqdweb?did=37651853&Fmt=4&clientId=13664&RQT=309&VName=PQD (accessed April 12, 2009).

68. Ibid., 29-30 and Pushies, *Night Stalkers…*, 70-76.

A CH142 (CH146) Griffon Helicopter from 427 SOAS practices an insertion in a field near Kamloops, BC
CF Photo by Lt(N) Meghan Marsaw

AIRPOWER VISIONARIES

A Cautionary
Tale for
Modern Times

By Major Gerry D. Madigan
CD1, MA (Retired)

Man has always had a keen desire to push the boundaries of his physical world. One such boundary was to fly and to reach for the stars, which came true during the 20th century. But such desires were nurtured by the dreams of the visionaries of the 19th century, like H.G. Wells, in their writings.[1] In time the visions of the future passed from fiction to reality. Still there was little to guide mankind other than the phantasmagorical that had to be rendered to reality.

It was also a time when the world was starting to become a smaller place. New wonders and modern marvels such as the airplane and wireless telegraphy served to shrink time and geography. It was a heady time for technology and scientific innovation was seen as a panacea for solving all man's problems and easing strife, burden, and labour. There was little contextual experience or history guiding this new fantastic technological revolution. It was akin to receiving a gift in a box where the plans or the blueprints were sketchy and lacking detail. Final assembly was often left to the imagination of the beholder. Thus the dreamers and visionaries were necessary to guide the placement of new innovations in context of modern times.

New technology, though, ultimately influenced the battlefield of World War I and in the end it influenced man's post-war thinking. Modern military aviation was still a relatively new element and was not yet considered a decisive factor in the conduct of war. Many saw air power as an aberration of war. It was not a decisive factor in winning the war, and consequently, its utility was questioned by the wider establishment.

On the other hand, visionaries such as Giulio Douhet saw the land battles of the Great War largely as unprofitable ventures that

> *"And it shall come to pass afterward, that I will pour out my spirit upon all flesh; and your sons and your daughters shall prophesy, your old men shall dream dreams, your young men shall see visions:"*
>
> - Joel 2:28 (King James Version)

were locked in virtual stalemate. The human cost in casualties and investment of national treasure was enormous. Many felt the war leadership of the day was incapable of dealing with or managing new technologies on the battlefield. The horror was telling;[2] more men were killed on the western front in the First World War than on the same front in the Second World War.[3] This left the survivors to contemplate and wonder how to avoid this morass in future.

Giulio Douhet, Billy Mitchell, and Sir Hugh Trenchard are often considered to be visionaries and founding fathers of modern air strategy. Their musings, writings, and actions greatly influenced the concepts of modern air warfare. Simply, there was no one else to rely on for opinion or expertise. There were only a privileged few who had experience in the application of "air power." The age of modern air power was brand new; an open field of human endeavour, and these visionaries were attempting to place air power in the context of a world of rapidly evolving technological and scientific change. But were visionaries at the onset of air power's beginning useful or were they a hindrance? The answer to that question is likely both!

The experience of the early 20th century visionaries serves a cautionary tale, though, for those espousing "visions" in our time. General Giulio Douhet, author of the landmark work *The Command of the Air* and Colonel William (Billy) Mitchell's *Winged Defense* were instrumental in establishing the bounds of future air policy and strategy in the development of modern air forces. Douhet was one of the first proponents of the modern air force as an independent arm in a nation's defence and security paradigm. He saw that technology promised innovative solutions at a minimum dollar and human capital cost while

concomitantly maximizing a nation's security and power projection. Thus Douhet's and other visionaries' work set the modern foundation for making defence policy requirements based on the lowest common denominator of the "cheapest bang for the buck" and framing the funding debates amongst the needs of army, navy and air forces of the day.

Modern defence managers must have a sense of déjà vu as many defence arguments and requirements today are also framed from the lowest common denominator of the cheapest bang for the buck, that is, the lowest cost framework. So logically, the eventual employment of a weapon, system, or organization, must also be framed doctrinally on a lowest cost model if it is to have any meaningful application and success. The lowest cost framework ultimately required defence establishments to defend their positions—visions, if you will—in the public eye through annual defence appropriations and budgetary cycles. The public will be looking at a defence organization or procurement from that perspective, and thus, will be skeptical of any change if it requires additional investment or if it deviates from the promise of the cheapest bang for the buck, or requires any additional expense. Defence based on the cheapest bang for the buck is a reality.

THE EVOLUTION OF A MODERN SPENDING FRAMEWORK

Douhet's *The Command of the Air* and Mitchell's *Winged Defense* provide some clues to the evolution of a modern spending framework. Both works were not only profound but were also controversial. Both authors fought passionately for the very existence of the modern air force as an independent arm at a time when defence resources were slim and not much was available to go around the table. Both felt that others were bound by tradition.[4] But many defence chiefs thought the air element was an inconsequential and indecisive tool on the battleground. The prevailing thought was that air power was an aberration of modern warfare. As such, air power, or more pointedly, an independent air force was an unnecessary adjunct to national defence.

GENERAL GIULIO DOUHET

Douhet's story is compelling. Surprisingly, he recognized early on in his studies the limitations of national budgets on defence funding. He deduced that resources were not limitless. But this deduction pitted him against his army and naval rivals in the coming trade-offs and budgetary fights for a share in the post-war economy. Douhet posited that defence requirements were choices that must be made as inputs to appropriate defence structures whose outcomes were outputs of national defence or security. Douhet structured his arguments for the creation of an independent air arm and the need for its separate funding in an already shrunken resource base. He strongly argued that auxiliary air power of other arms was superfluous, and if desired, auxiliary air power should be funded from within the existing budgets of the other arms. Thus he staked the ground for the establishment of an independent air arm at the expense of the army and naval chiefs of his day.[5] He was not a popular man, to say the least. Douhet had it right, though. The debate had to be focused on costs and resources, but he was wrong to conclude that air power alone

COLONEL WILLIAM (BILLY) MITCHELL

provided a nation with an all-encompassing cost solution to its leading defence requirements.

Mitchell's thesis in *Winged Defense* arrived at the same conclusion.[6] His arguments parallel Douhet's and some have suggested that Mitchell "borrowed" much from Douhet.[7] But the truth is many visionaries were not necessarily originators of original thought. The period following the Great War was an era where ideas were likely borrowed or shared amongst an international community of World War I veterans who sought to apply the grim lessons learned.[8] Their main contribution then was to be champions of air power and stimulators of an ongoing debate in the promotion of an independent air force.

CONSEQUENCES & PROBLEMS

The problem was the bomber was being doctrinally positioned as the pre-eminent weapon of the modern air force. It was to operate in mass and the indigenous defensive armament of the bomber stream was to provide a measure of protection. It was being positioned as a cheaper security option relative to other services. The bomber was touted as the weapon that "would always get through!" The perfect plane was the battle plane, one that would carry sufficient bomb load to dislocate an enemy while having sufficient weight of arms for its own self-protection. Pursuit aviation was considered a waste of resources. All these arguments had a certain appeal to a war-weary public and many a cash-strapped government with fragile economies in the wake of the Great War. Thus the "lowest cost framework" was driving the needs of a modern air force establishment that doctrinally set the bomber in the highest firmament at the outset of its birth.

So on the one hand it may be argued that the visionaries' position added value by focusing the discussion on resources and costs, but on the other hand, the conclusion leading to the preeminence of the bomber at the expense of pursuit aviation may have also led to undue future costs in the loss of human lives and treasure that were unknown until the next war. This suggests for all their effort, there is a very real problem with "visionaries." They did not have all the answers at the time when future long-term defence decisions were being made. Their conclusions were based on sparse data and minimal experience. The introduction of new technologies, their true costs, and the passion of leading change tended to blind side many. Vision tended to run interference with common sense. It seemed that it was more important to stake a service position and "duke it out" with other services, rather than taking a holistic approach to a nation's defence by placing it in proper perspective, working out the details and managing a defence portfolio cooperatively for all army, navy and air force requirements. There was certain arrogance amongst the services that tended to limit the discussion and set lines in the sand as each service maintained that it held the supreme role for a nation's defence.

But Douhet, Mitchell and others saw the air as new and fertile ground in this milieu. The medium of the air was the grist for the

development of modern warfare where many visualized that decisive battle would indeed be fought. There were no other champions but they who had experience of air operations, and in their opinion, armies and navies were dinosaurs and should be relegated to secondary roles. This was a decisively revolutionary and provocative opinion being put forward to the defence establishment of the day, one that would place many at odds with their superiors and other defence chiefs, and one that would eventually lead to Douhet's and Mitchell's court martials.[9] It tended to raise the hackles of many and stiffened resistance to change.

The visionaries argued for the needs of an independent air force. But their arguments had to have a credible defence/security mission if they were to have any success. Douhet saw his mission as aerial artillery in a continental duel amongst the great European powers.[10] Mitchell fought for the creation of a balanced air force with a role in coastal defence.[11] Trenchard saw the role of aerial policing of the empire.[12] Regardless, many recognized the value of air power and many were willing to fall on their swords for its place in a nation's defence arsenal.

LESSONS

The Great War, the war to end all wars, had a tremendous impact on national psyche. A whole generation was left scarred by the experience. That generation vowed never to repeat the process or endure such carnage on such a scale ever again; physically, mentally, spiritually or emotionally.[13] Consequently, the experience of the First World War transfixed national psyche on its horrors. Thus the mere threat of war had the potential for many social and economic ramifications.[14] Many nations were war weary and were in no mood for the wanderlust of creating or expanding defence establishments. But nations were open to arguments that limited their costs or sought opportunities that would either prevent war or diminish the duration of the unwanted horror. So there was a window of opportunity for air power "visionaries" to stake the claim for an independent air force. Governments were being corralled toward solutions for their defence requirements or face the attendant

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costs in social breakdown, social disorder, internal unrest, violence, or revolution. They were also being corralled in managing their defence spending from the lowest cost framework.

Technology was seen as the solution to man's problems. Mann states: "Technology and ideas have a dynamic relationship. Sometimes concepts of employment lead to new technologies; sometimes new technologies require different concepts of employment." [15] Mann's statement places Douhet's and his contemporaries' conundrum in the context of their times. They were leading change with little historical precedence to fall back on or guide them. They attempted to introduce a revolutionary concept concomitantly in a rapidly changing technological environment. The dynamic of change proceeded under the influence of the personalities of the reformers, the social and organizational culture of the visionaries, the military staff, and the domestic and political situations of various nations between the 1920s and 1930s. Combat systems and technology

from aircraft, armour, to armament, evolved and matured. The real debate was not whether they would ever be used but turned to "when and how" new innovations would be used. And there were many opportunities for testing them in the 1930s, particularly in Spain and Ethiopia.[16]

Air warfare was new indeed. Douhet in particular had developed concepts based on 20 years of the aeroplane's existence, and with only five or six years of combat, to develop a theory on the practical application of air power. Douhet and his contemporaries thus tried to picture an entirely new way of waging war. Their strategic predecessors, Clausewitz and Jomini, had thousands of years of experience from which to draw upon in land war, while Mahan had a comparable range of experience for naval warfare. There was little case support for their views that often placed them at odds with their peers and the military establishment. But the value of the debate was that they staked out the strategic use of air power by itself as the argument for a theory of the command of the air.

Douhet considered the traditional view of a two dimensional nature of war as both obsolete and restrictive. The battlefield was no longer strictly defined by a forward or a flanking edge. There was a new and a third dimension to it: the air. This was the new dimension for the employment and use of air power. In Douhet's view, the limitations of battles with lines on the ground could easily be overcome by air power. Air power provided a commander with a new and unexploited opportunity because there now existed a means to go over defensive positions rather than going through them. In his words, "Nothing man can do on the surface of the earth can interfere with a plane in flight, moving freely in a third dimension."[17]

Because of the aeroplane, the battlefield was now extended beyond the frontier boundaries of the nations at war. Douhet concluded that all citizens would be combatants and that there was no longer a distinction between citizen and soldier. This would have a profound impact on the direction of political views and the consideration of the conduct of future

wars.[18] This was total war as Clausewitz and Jomini had envisaged it.[19]

Douhet hypothesized that the form of war depended upon the technical means available to conduct it.[20] It was the new technology of the airplane that he wanted to use as a lever for change. He deduced that increased firepower of firearms favoured the defensive.[21] In his mind, this meant that wars could be won by offensive operations.[22] In his view, war was prolonged by the failure to understand the nature and demands of modern war that was being shaped by the development of modern firearms.[23] He recommended that military thinkers stop and examine the questions of the right path in order to provide for an effective national defence.[24] These points were also being considered by his peers and colleagues in other service elements.

The theories that Douhet, Mitchell, Trenchard, and others put forward solidified the doctrine that "the bomber will always get through." This sound bite influenced how governments viewed air power. It influenced how governments would spend their scarce defence resources from the end of the Great War to World War II.[25] This was to have unforeseen consequences that resulted in unnecessary wastage, crew fatalities, and aircraft lost during World War II. The hard lesson had to be learned that pursuit aircraft was a necessary adjunct to a modern air force and though the bomber would always get through, it would do so at a considerable cost in lives and aircraft if not adequately protected. This was learned later and early on in World War II.

Douhet's influence was most likely felt in the immediate development of modern aircraft. He envisaged an aircraft suitable for both combat and bombing.[26] His perfect model was directed to the establishment of an air force consisting entirely of battle planes.[27] Under this concept, battle planes provided a means for full freedom of action of employing units in both bomber and combat roles.[28] Thus in Douhet's view, the air arm was cheaper and more effective in waging war. He theorized that a thousand 6,000 horsepower planes costing approximately

Two Hurricanes and the Avro Lancaster fly over the the Battle of Britain parade, September 17, 2006.
CF Photo by Master Corporal Jill Cooper

as much as 10 battleships, required an amount of material equivalent to the construction of one battle ship, and needed fewer inputs of labour in their employment compared to naval power. [29] He thus established an economic argument that air power was cheaper relative to the other arms. But he also established the parameters for the construction of ideal aircraft *that discounted speed and manoeuvrability* (italicized for emphasis). His argument—vision, if you will—set the framework for future defence and air power considerations. The downside of the vision based on "cheaper," was the appealing argument to the politicians of the day. It would have a tremendous loss of life and aircraft in the next war. [30]

Douhet and others became convinced that mass concentration alone was sufficient as a means of aerial defence. Aircraft only had to move forward and mass over a target to overcome its opponent. There was no need for speed or mobility, as the attacking force would provide its own means of defence from its integral weaponry. [31] Thus the public and governments clung to the promise of the Douhetian conclusion that in the next war an air force would be made up entirely of a single aircraft type. This theory espoused economy and efficiency based

on standardization, thus limiting capital outlays to a few multipurpose models that appealed to the public's and government's imagination. [32] There was simply no need for speed, only mass. Therefore any deviation from the model had to be vigorously defended and that made justification of post-war spending and change increasingly difficult.

The arguments that Douhet, Mitchell, Trenchard and their contemporaries put forward appealed to an interested public. But they were cementing a doctrinal framework premised on the bomber from which the modern air force and establishments eventually evolved. [33] They were at odds with the needs of balanced defence spending and they set the precedent for future investment and development of an air force.

What likely made the deliberations much more difficult was the nature of the independent service establishments. Each service had its own ministry/department. What Douhet, Mitchell, Trenchard and others were asking of the existing establishment was the virtual creation of a new ministry at a time of reduced defence spending. Such a ministry would bring

with it an additional commitment to increase defence spending. Maintaining their share of the defence budget was an ongoing source of friction between the two senior services. Therefore, the army and navy of the day likely and rightly viewed the call for a new service as impudent, an upstart that had either to be quashed or defended against expeditiously.

The era likely demanded a need for quiet diplomacy and collegiality, but the players were not amenable or in a state of mind to that end. The bellicosity of many champions of air power did not help the cause.[34] Thus, service lines were strictly drawn and were being jealously guarded. The creation of a new service would mean sharing of the scant resources available. What was to be the quid pro quo? None was offered, in fact it was often suggested that if the services had air requirements, they would have to develop and pay for these from their own budgets. Certainly, this was not a great way to make inroads to the power structure or to help make friends to further the cause.

Victory during the Great War could be seen as a mixed blessing for the Allies. They had won the war but the peace left the defence establishment with little inclination, time or money to invest for the future. Peace fostered the seeds of retrenchment for the victors in old ways and doctrines. There were huge stocks of materiel and war surplus at hand. There was no incentive for change amongst the victors, whereas the conquered were faced with huge reparations and loss of materiel that left them little choice but for revolutionary change over the long term. Investments for doctrinal change were focused differently depending on whether you were a winner or loser. War surplus and materiel left the victors to contemplate their use that favoured the traditional "doctrines" of the past war that seemingly aided their success. The post-war struggle likely paved a different path for the vanquished as the early victories at the beginning of World War II tend to suggest. The vanquished had no choice but to invent new doctrine, as they had little surplus or materiel stock in the first place, and second, they were constrained by arms limitations imposed by the Treaty of Versailles.[35]

YOUR OLD MEN SHALL DREAM DREAMS, YOUR YOUNG MEN SHALL SEE VISIONS

Visionaries kept the discussion at the forefront. That was their contribution in the early days, but the problem with visions is that they often are not tangible or real. Visions at best are nothing more than intellectual feelers, a strawman to test reality. They may provide a map for the way ahead, but that map can become obsolete very fast. A vision thus requires constant updating as experience and history are gained. It should only be a test crucible, not an article of faith. A vision should not become the quest for the Holy Grail, a proving point at the expense of truth. Visions unchallenged can inculcate a process or philosophy that must be continually proven to be true. Change in this milieu may be viewed as an admission of an error in judgment. So there may be little incentive for change if the change does not support the vision.

Often a visionary is on the horns of a dilemma; to pursue the vision in spite of setbacks or discard the vision if it does not pan out. However, if one truly believes in the vision, then there may be a place for strong leadership mixed with a liberal dose of guile, to force change especially in the face of accepted doctrine.

The experience of Douhet, Mitchell, Trenchard and their contemporaries was no different than that faced today by present day visionaries and dreamers. This is the cautionary tale for modern times. There is much debate on revolutions in military affairs, strategic lift, focused logistics, and communications amongst many topics that demand our attention in the management of chaos, war and conflict. All these are being argued concurrently and too often are in direct competition with one another for limited financial resources. Unlike our predecessors' day, what may be lacking in our time is a sense of passion.

Today's technology is ubiquitous but it fails to excite the imagination of nations. Buzz Aldrin, one of the first to reach beyond

our planet, put it this way recently: "We have remained, since our Apollo days, locked in Earth orbit. But five years ago, NASA was tasked with returning to the moon by 2020, rerunning the moon race that we won 40 years ago. Not surprisingly, this new race has failed to ignite the imagination of young Americans -- or their leaders."[36] It may well be that in today's world, many feel there is nothing left worth exploring or that it is too expensive to do so. It may also be that we have become inured to the quest for vision because of the accelerated pace of constant change that has led to techno-logical obsolence in the blink of an eye and the constant draw on taxpayers' purse strings.

Visionaries and dreamers are still necessary today. We still need to get excited from time to time. Somebody needs to lead us out of chaos and lead us through the complexity of the de-fence budget. Somebody needs to give us focus on the way ahead. That increasingly difficult task falls to military leadership. Issues have to be brought to life and debated, but there must also be time to step back to take stock.

Visions are just that, visions. Sometimes course corrections are in order. Again that is where leadership comes into play to provide direction. Necessary change, though, should not be viewed as an admission of failure. Yet change of direction is too often viewed as an admission of error. Change must be viewed as the substance that provides the muscle on the framework of our present and future defence policy if it is to prevent undue waste.

A true visionary is one who recognizes that a vision is not immutable and has the ability to communicate that fact to a wider public beyond the defence community. A true visionary is one capable of guiding change even at the expense of highly held precepts. Theoretical musings are just that, theoretical. Visionaries should not just be dreamers, they need be practical guides to reality. So, just like visions, visionaries must change. And the daring do! ∎

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Notes

1. Stephan Budiansky, *Air Power – The Men, Machines, and Ideas that Revolutionized War, From Kittyhawk to Iraq* (New York: Penguin Books, 2004), 6-7.

2. Ibid., 46-47.

3. R. R. Palmer and J. Colton, *A History of the Modern World* (New York: Alfred A. Knopf, 1967), 672-73.

4. Budiansky, 147. See Mitchell's tack in particular. He wanted a "decisive showdown of air power against sea power, the new against the old, innovation against tradition."

5. Ibid., 138 and Giulio Douhet, *The Command Of the Air,* trans. Dino Ferrari (New York: Coward-McCann, Inc., 1942), 76. The organization and functioning of independent aviation must be free of outside control. Although it stemmed from the army and navy, aviation has reached maturity and should be emancipated.

6. William Mitchell, *Winged Defense – The Development and Possibilities of Modern Air Power Economic and Military,* (New York: Dover Publications, Inc., 1988; originally published in 1925 by G.P. Putnam's Sons, New York and London), 215, 221-23.

7. Randy Kee, "Brig Gen Billy Mitchell's Continuing Legacy to USAF Doctrine," *Air & Space Power Journal - Chronicles Online Journal,* 8 July 1999. Available online at http://www.airpower.maxwell.af.mil/airch-ronicles/cc/kee1.html (accessed August 12, 2009).

8. Peter Paret, *Makers of Modern Strategy, Military Thought from Machiavelli to the Nuclear Age,* (Princet-on, NJ: Princeton University Press, 1986), 631.

9. Kee, available online at http://www.airpower.maxwell.af.mil/airchronicles/cc/kee1.html (accessed August 12, 2009).

10. Douhet, 34-40.

11. Mitchell, 215.

12. National Archives, United Kingdom, "RAF in Iraq: Note to the Cabinet by the Chief of the Air Staff, Hugh Trenchard, regarding the use of air power in Iraq between 1920-22." Catalogue reference: AIR19/109 (Oct 1922). Available online at http://www.nationalarchives.gov.uk/pathways/firstworldwar/aftermath/p_iraq.htm (accessed August 12, 2009). This report by Hugh Trenchard, the RAF's chief of staff between 1919 and 1927, was submitted to the Cabinet shortly after the RAF had quelled Turkish-led unrest in the Kurdistan area of Iraq. As war secretary Winston Churchill argued, this striking demonstration of the potential of independent air power offered the prospect of upholding "our Imperial prestige … with a minimum of expenditure both in lives and money." In the difficult economic conditions of the immediate post-war period, these were important considerations. The air campaign in Iraq thus helped to cement the RAF's position as a fully independent service.

13. Palmer and Colton, 818-20.

14. In support of this statement see D. Morton and G. Wright. *Winning the Second Battle. Canadian Veterans and the Return to Civilian Life 1915-1930.* (Toronto: The University of Toronto Press). See also Palmer and Colton, 689-94, 704-51.

15. Edward Mann "One Target, One Bomb – Is the Principle of Mass Dead?" *Airpower Journal* (Spring 1993). Available online at http://www.airpower.au.af.mil/airchronicles/apj/apj93/spr93/mann.htm (accessed August 12, 2009).

16. Palmer and Colton, 820-21.

17. Douhet, 9.

18. Ibid., 10.

19. A. Baron de Jomini, "The Art of War," *Messenger* (London: Greenhill Books, 1992), and Carl von Clausewitz, *On War,* ed. and trans. M. Howard and P. Paret (Princeton: Princeton University Press, 1989), 87.

20. Douhet, 6.

21. Ibid., 11-12.

22. Ibid., 12.

23. Ibid., 14-15.

24. Ibid., 15.

25. Budiansky, 184. The bomber's ascent brought about the fighters' nadir.

26. Douhet, 115-17.

27. Ibid., 117.

28. Ibid., 118.

29. Ibid., 199.

30. The author recommends Martin Caidin, *Black Thursday* (New York: Ballantine Books, 1960); Murray Peden, *A Thousand Shall Fall* (Toronto: Stoddart, 1988); and Spencer Dunmore and William Carter, *Reap The Whirlwind* (Toronto: McClelland & Stewart Inc., 1991).

31. Douhet, 36-40, 42, 44-45, 246, 257, 262.

32. Ibid., 338, and Budiansky, 184-86.

33. Budiansky, 186.

34. Ibid., 126-27.

35. Margaret MacMillan, *Paris,1919 – Six Months That Changed The World* (New York: Random House Trade Paperbacks, 2002), 157-203.

36. Buzz Aldrin, "Commentary: Let's aim for Mars," CNN, (23 June 2009), available online at http://www.cnn.com/2009/TECH/space/06/23/aldrin.mars/index.html (accessed August 12, 2009).

THE EMERGENCE OF A "DOCTRINAL CULTURE"

WITHIN THE CANADIAN AIR FORCE:

WHERE IT CAME FROM, WHERE IT'S AT AND WHERE TO FROM HERE?

PART 2: Towards a Doctrinal Culture within the Canadian Air Force

By Aaron P. Jackson

INTRODUCTION

This is the second of two articles that examine the origin, evolution and future potential of the recent emergence of a tentative "doctrinal culture" within the Canadian Air Force. In the first article it was postulated that the culture of the Canadian Air Force, like most other Western air forces, has not been traditionally characterised by a tendency towards theoretical or doctrinal development. Instead, a strong oral (rather than written) culture of passing lessons from senior to junior officers evolved early in the history of the Canadian Air Force and subsequently became entrenched. This was accompanied by a tendency to pragmatically focus on contemporary issues, to the detriment of broader theoretical and doctrinal development.[1]

Recently, however, there have been some indications that the Canadian Air Force is beginning to shift away from this cultural paradigm, and that a tentative culture of doctrinal development is emerging to take its place. Drawing on the background provided in Part 1, this article examines the Canadian Air Force's attempts to develop doctrine since the formation of Air Command in 1975. This examination is undertaken in three sections. First, limited doctrine development between 1975 and 1989 is briefly discussed. Second, doctrine development during the 1990s is analysed in relation to the international rejuvenation of air power theory that occurred during that decade. Third, the apparent emergence of a tentative doctrinal culture within the Canadian Air Force during the past decade is considered. In conclusion, the future potential of this tentative culture is addressed, and some challenges that remain to be overcome are highlighted.

LIMITED DOCTRINE DEVELOPMENT, 1975-1989

The first part of this article established that by the close of the Second World War the oral dissemination of ideas between officers had become a significant feature of Canadian Air Force culture. This was accompanied by a tendency to eschew written theory and doctrine and was perpetuated during the cold war by several major events. The first of these was the Royal Canadian Air Force's (RCAF's) adoption of Royal Air Force (RAF) and United States Air Force (USAF) tactical and operational doctrine (subject to its existence). Not only did this constitute a disincentive to the development of an independent body of Canadian Air Force theory and doctrine, it arguably served to narrow the focus of many officers to operational and tactical issues, to the detriment of strategic thinking.

The second major event was the unification of the Canadian Forces (CF) in 1968, which dismantled the RCAF and divided its former units between the CF's six new "commands" according to their primary function. This division had the effect of heightening the prominence of the Canadian Air Force's capability-based "communities,"[2] something that has had ongoing ramifications for doctrine development within the Canadian Air Force ever since. In the short-term, unification eliminated the branch of the CF that had previously been responsible for the development of air power doctrine, without giving any indication as to which organisation would replace it.

The amalgamation of Air Defence and Air Transport Commands into Air Command in 1975 provided a foundation upon which a post-unification Canadian Air Force culture could be rebuilt.[3] On its inauguration, the new command inherited a substantial doctrinal void. Since unification, virtually no air power doctrine, including that designed to guide the tactical level of conflict, had been produced by the CF. Despite the significance of this dearth, doctrine development progressed slowly, no doubt due—at least in part—to an ongoing cultural tendency to eschew to written theory and doctrine. The first noteworthy air power doctrine manual produced after unification, *Conduct of Air Operations*, was not released until June 1981.[4] Even this was only an updated edition of a pre-1968 publication, and its scope and utility were severely limited.[5]

Figure 1: Canadian Air Force doctrine hierarchy endorsed by the Aerospace Doctrine Board in 1986.
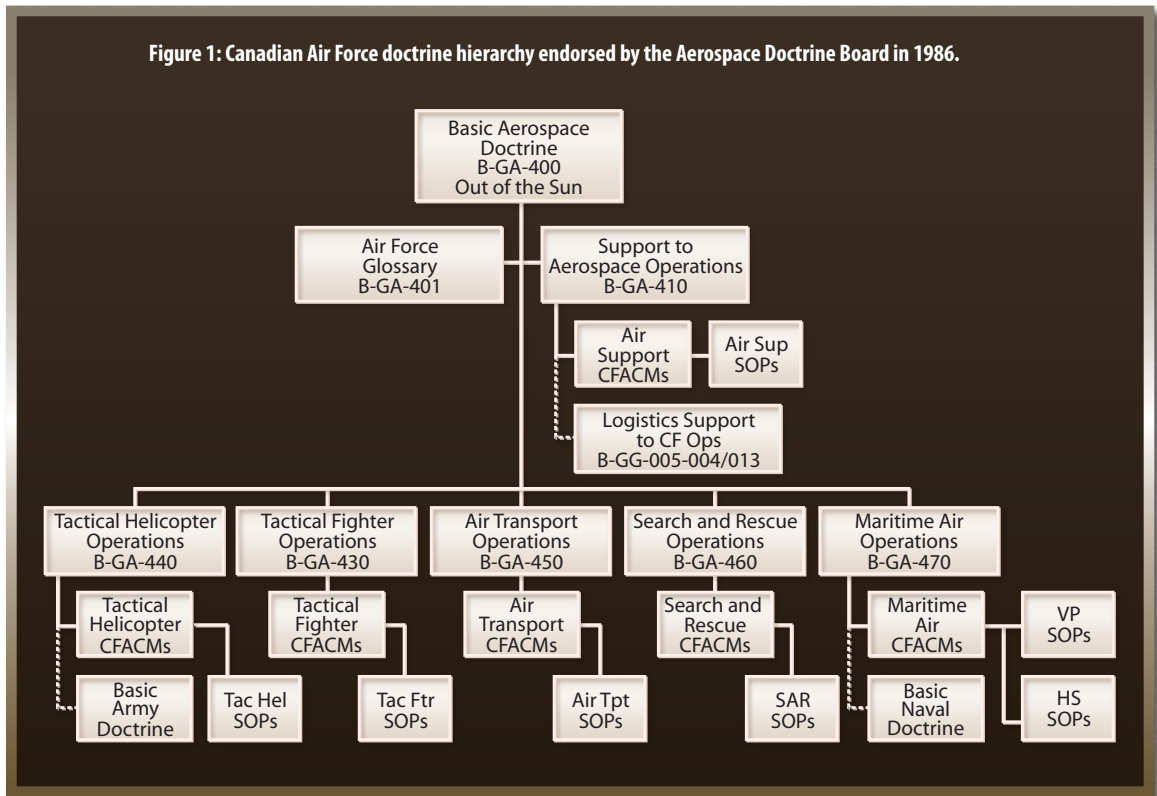
In 1984, Lieutenant-General Paul Manson, then Commander Air Command, convened a conference to address "the fragmented state of aerospace doctrine."[6] The outcome of the conference was the establishment of an Aerospace Doctrine Board (ADB) in 1986, which quickly endorsed a new doctrine hierarchy (see Figure 1).[7] From the outset, the hierarchy included a keystone doctrine manual,[8] which was published in 1989 under the title *Basic Aerospace Doctrine*.[9]

Although the production of *Basic Aerospace Doctrine* had the potential to constitute a significant step towards redressing the Canadian Air Force's institutional apathy towards written theory and doctrine, this opportunity was ultimately lost for several reasons. First, despite the inclusion of brief explanations of military doctrine, "Canadian strategic doctrine" (strategic policy), the principles of war, and the relationship between war and the nation,[10] the

manual was not placed on a sound theoretical footing. Second, distribution of the manual appears to have been limited to within the CF (severely hampering its potential to initiate a broader theoretical debate about Canadian air power), even though it is unlikely that it ever had a "restricted" status. Third, the entire doctrine hierarchy, including *Basic Aerospace Doctrine*, failed to sufficiently address strategic-level considerations, "in particular space and strategic aerospace defence."[11]

Shortly after the release of *Basic Aerospace Doctrine*, the Canadian Air Force's entire doctrine hierarchy fell into a state of disrepair. This was mainly due to the lack of manpower and expertise available to maintain the hierarchy's currency on an ongoing basis,[12] although this was most likely compounded by additional factors such as a lack of sound Canadian strategic policy guidance during the period and the Air Force's existing cultural tendency to eschew

written doctrine. Canadian Air Force doctrine development subsequently waned during the early 1990s.

THE 1990S: "THE EMANCIPATION OF AIR POWER"

Shortly after the release of *Basic Aerospace Doctrine*, the 1991 Gulf War led to the widespread re-emergence of the theoretical development of air power, an occurrence that would later be described by Markus Mader as "the emancipation of air power."[13] Regarding the Gulf War itself, Mader went on to assert that:

> The contribution of the allied air forces to the campaign proved to be more than a supporting role and was in fact interpreted by many as a war-winning role. Airmen were henceforth considered to be equal partners to their military and maritime counterparts in the all-arms high-intensity warfare. Finally, it appeared, military aviation could apply its technological edge to a degree which proved decisive, and live up to early 20th century imaginations.[14]

Largely responsible for the subsequent theoretical rejuvenation of air power was the widespread use of precision-guided munitions in both tactical and strategic roles. The use of these munitions was also a major contributing factor to the Revolution in Military Affairs (RMA) debate that took place during the early and mid 1990s.[15] Although this debate focused primarily on technological advances and whether or not they had brought about a radical departure from previous modes of warfare, much of it was nonetheless related to the application of air power.[16]

Within Western air forces, this emancipation resulted in an increased willingness on the part of officers to discuss in writing what it was they did, and more importantly, how and why they did it. Against this backdrop, several air forces approached doctrine development

with a fresh perspective, particularly in instances where doctrine was designed to provide overarching guidance at the strategic level.[17]

Yet doctrine development within the Canadian Air Force lagged a few years behind developments within allied air forces, such as the USAF and RAF (which had released new keystone doctrine manuals in 1992 and 1993 respectively).[18] One of the key reasons for this was circumstantial. As the Gulf War was taking place in the Middle East, the Soviet Union was in the final stages of collapse. As these events combined to trigger a period of global strategic uncertainty, the Canadian Air Force suffered particularly acutely from a lack of strategic policy guidance.

Even after Canada's 1994 *Defence White Paper* finally provided some respite from the strategic uncertainty, the Air Force continued to suffer from a declining budgetary allocation. Although the White Paper had established a requirement for "[t]he retention of multi-purpose, combat capable forces,"[19] it had also shifted the operational emphasis towards the army. As a result of this new emphasis, the Canadian Air Force's budget fell from C\$3 billion in 1994 to C\$2.2 billion in 1998.[20]

Furthermore, it is likely that the Canadian Air Force's doctrinal lag behind other Western air forces was compounded by several of the factors that had historically resulted in the organisation's cultural tendency to eschew to written theory and doctrine. In particular, the close cultural link between the Canadian Air Force and its American counterpart most probably led to a continued inclination on the part of Canadian Air Force officers to refer to USAF doctrine developments in preference to undertaking doctrine development domestically.[21]

Despite these factors, the eventual catalyst for the Canadian Air Force's production of a new keystone doctrine manual was a meeting of the ADB in October 1994, at which it was determined that a replacement for *Basic Aerospace*

Doctrine was required. This was because *Basic Aerospace Doctrine* "lacked consistency and balance, perpetuated 'stove piping,' and did not reflect current thinking about air power."[22] Although this determination was made in 1994, it took almost three years for a replacement publication to be developed. Furthermore, when production finally did occur, it was rushed so that something could be released in time for the 1997 Aerospace Power Conference. The result, *Out of the Sun: Aerospace Doctrine for the Canadian Forces"* was based primarily upon a précis on air power theory developed at the Canadian Forces College (CFC) in Toronto."[23]

From the outset, *Out of the Sun* encountered a multitude of problems that ultimately led to its failure. The first of these was that (as had been the case with *Basic Aerospace Doctrine*) there was no effective authority to distribute, publicise, update or maintain it.[24] Abetting this problem was the unique format of *Out of the Sun*, which was originally released as a unilingual publication without a National Defence Index of Documentation (NDID) number, meaning that it could not be traced or ordered through official channels.[25]

The second problem *Out of the Sun* encountered was that its content was intellectually questionable. In particular, its discussion about the spectrum of air force operations preceded under three headings (air combat, supporting air and sustainment operations),[26] the accompanying definitions of which were often simplistic and occasionally contradictory.[27] As a result, *Out of the Sun* failed to explain the rationale underlying the existence of Canada's Air Force. As Paul Mitchell noted, "*Out of the Sun* tells one how the air force seeks to accomplish its missions, but not why, nor more importantly, why this is critical to Canada as a nation."[28] Like *Basic Aerospace Doctrine* before it, *Out of the Sun* had not been placed on a sound theoretical footing.

Finally, *Out of the Sun* fell victim to the strong influence capability-based communities had within the Canadian Air Force. Indeed,

the content of *Out of the Sun* aroused the objection of elements within almost all of the air force's capability-based communities. As a result, the majority of the Air Force itself failed to embrace the manual and its effect, if it had one, is barely noticeable.[29] Following the 1997 Aerospace Power Conference, *Out of the Sun* appears to have been unofficially relegated to use as an instruction manual at the CFC. As Paul Johnston asserted, "there is scant evidence that it is ever used or referred to by anyone actually applying air power."[30]

THE RECENT EMERGENCE OF A TENTATIVE DOCTRINAL CULTURE

By the close of the 1990s the Canadian Air Force had produced two keystone doctrine manuals in the span of a decade, and both had ultimately failed to have much (if any) impact. Underlying these dual failures were three common factors. The first was the failure to base the content of the manuals upon a sound theoretical framework and second was inadequate distribution. When these factors combined with the third factor—the air force's longstanding institutional apathy towards written theory and doctrine—the failure of both doctrine manuals can be seen as unsurprising.

Following the release of *Out of the Sun*, Canadian Air Force doctrine development again waned. A restructuring of air force headquarters necessitated changes to the ADB, which was renamed the Air Doctrine and Concepts Board (ADCB) in 1997. At its inaugural meeting, the ADCB endorsed a new doctrine hierarchy to replace the hierarchy that had been endorsed in 1986 (see Figure 2).[31]

The progress of events thereafter was later summarised by Colonel John Westrop:

The inaugural session of the ADCB was convened at NDHQ [National Defence Headquarters] on 29 Nov 97, and the subsequent (and final) session took place

Figure 2: Revised Canadian Air Force doctrine hierarchy endorsed by the Aerospace Doctrine and Concepts Board in 1997.

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                    ┌─────────────────────┐
                    │ Basic Aerospace     │
                    │ Doctrine            │
                    │ B-GA-400            │
                    │ Out of the Sun      │
                    └─────────────────────┘
                    ┌─────────────────────┐
                    │ Air Campaign Manual │
                    │ B-GA-4XX            │
                    │ (Proposed)          │
                    └─────────────────────┘
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Tactical Helicopter Operations TTP-440 (Proposed)	Tactical Fighter Operations TTP-430 (Proposed)	Air Transport Operations TTP-450 (Proposed)

| Search and Rescue Operations TTP-460 (Proposed) | Air Support Operations TTP-410 (Proposed) | Maritime Air Operations TTP-470 (Proposed) |

| Tac Hel SOPs | SAR SOPs | Tac Ftr SOPs | Air Sup SOPs | Air Tpt SOPs | VP SOPs |

HS SOPs

on 26 May 98. Since then there has been little activity by the ADCB; in particular there has been no progress on developing the "new" hierarchy of aerospace doctrine manuals. Instead, sporadic action has taken place to update some doctrine publications in the "old" hierarchy. With minor exceptions, since the reconfiguration of the ADB into the ADCB, the coherent promulgation of CF aerospace doctrine has virtually ceased.[32]

In December 2000 this situation was formerly acknowledged by the Air Force Development Committee, which proposed a study be conducted to determine a course of action for rectifying the absence of up-to-date air force doctrine. In August 2001, an "Aerospace Doctrine Study" commenced under the direction of Colonel Westrop.[33]

The Study's final report, dated April 30, 2002, made several recommendations. Key among these were the creation of an "Aerospace Doctrine Authority" (ADA) and an "aerospace doctrine system framework" to allow doctrine to be developed and disseminated, and also to undertake the "research, education, lessons learned, experimentation and simulation, and possibly history and heritage" functions associated with the development and application of doctrine.[34] To supplement this, it was also recommended that an Air Force publications centre be established and that the ADA be given a secondary role as the "CF Aerospace Warfare Authority," in order to ensure it was operating from a position of authority when developing and disseminating doctrine.[35]

By coincidence, the delivery of the final report of the Aerospace Doctrine Study
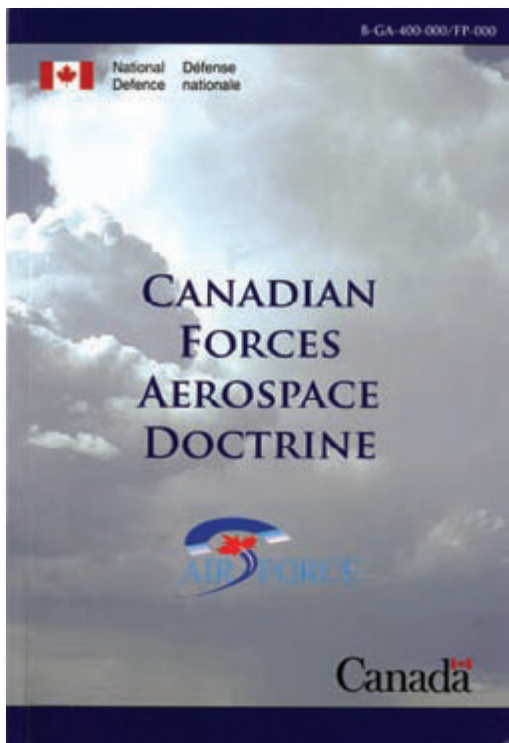
coincided with a crucial juncture in the air force's "transformation" program, which had commenced in 1999. As a result, the implementation of several of the study's recommendations subsequently became a central part of the program.

The catalyst for Air Force transformation was the June 1999 release of *Strategy 2020*,[36] which had been developed by the Department of National Defence (DND) to provide strategic guidance in the wake of numerous budget cuts that occurred during the late 1990s.[37] In 2000, the Air Force released a response to the strategy, titled *Vectors 2020: An Air Force Strategic Assessment*. Primarily, *Vectors 2020* provided "a series of signposts about air operations in 2020 so as to assist us in developing the air force of the future."[38]

Over the following few years, air force transformation was conceptually advanced by the release of two further documents. The first of these was *The Aerospace Capability Framework*, which established a comprehensive short-to-mid term agenda designed to provide more detail about the early steps in the transformation process.[39] The second document was *Strategic Vectors: The Air Force Transformation Vision*. This document established eight "vectors," which focused on a broad variety of operational, personnel and public relations priorities.[40]

Owing to the timing of the delivery of the Aerospace Doctrine Study's final report, several of its recommendations were featured as a central component of the transformation agenda established within both of these documents. Most importantly, *The Aerospace Capability Framework* directed the establishment of a Canadian Forces Aerospace Warfare Centre (CFAWC).[41] The establishment of the Centre was also a key part of the fourth "vector" contained within *Strategic Vectors*.[42] CFAWC was mandated to develop Canadian Air Force doctrine and distribute it, as well as conducting the related research, education, experimentation, simulation, lessons learned and conceptual development functions that had been identified as requirements by the Aerospace Doctrine Study.[43]

Following its establishment in October 2005, CFAWC undertook its educational and conceptual development functions through the commission of studies, and—more prominently—through the establishment of *The Canadian Air Force Journal*. Both of these activities have constituted important steps towards finally establishing a written culture within the Air Force. The primary responsibility of CFAWC, however, is the production of doctrine. Work on a new keystone manual commenced immediately after the establishment of the Centre, leading to the release of *Canadian Forces Aerospace Doctrine* in early 2007.[44]

Importantly, this new manual does not appear to suffer from the same shortfalls as its two predecessors. Conceptually, *Canadian Forces Aerospace Doctrine*'s major contribution occurred in its fifth chapter, which enunciated "the functions of Canada's Air Force."[45] The five functions—sense, shape, move, sustain,

command—were derived from the Army's combat functions, which have constituted a fundamental component of the evolution of Canadian army conceptual thinking since 2001.[46]

The decision to adapt an Army concept for use within Air Force doctrine probably came about for two reasons. First, it was felt that the concepts traditionally included in Air Force doctrine were "too inflexible." Early in the development process, the writing team was ordered to instead develop a functions-based approach for inclusion in the new manual. After a brief investigation, Army doctrine was selected as the "blueprint" for this development because Army conceptual development was perceived as comparatively advanced.[47] Second, it has been asserted that there was a growing feeling within the Air Force during the early 2000s that "the Army and Navy appears [sic] to have been able to make a politically better case for their service than the Air Force has."[48] The adaptation of an Army concept for use within Air Force doctrine may also have been part of an attempt to close this perceived gap.

Regardless of the reasons why the Air Force adapted an Army concept for inclusion within its own doctrine, a significant benefit of the development of the five functions is that it allowed the doctrine's discussion about Canadian air power to be located within a sound theoretical framework. Furthermore, the Air Force appears to have been able to successfully tie the roles of its various communities into this broader conceptual model, thus avoiding the problem of acceptance that was encountered following the release of *Out of the Sun*.

Steps have also been taken towards addressing the other problems previously encountered by Canadian Air Force doctrine. Unlike previous manuals, the release of *Canadian Forces Aerospace Doctrine* was widely publicised. Furthermore, distribution was not limited to within the Air Force itself and a link to a publicly-available online version has been prominently placed on CFAWC's homepage.[49]

Finally, the establishment of CFAWC and the subsequent publication of *The Canadian Air Force Journal* in particular have constituted significant moves towards establishing a broader culture of writing within the Canadian Air Force. In the longer term, the eventual success or failure of this attempt to generate cultural change within the Air Force is likely to be the most significant determinant of the ultimate success or failure of *Canadian Forces Aerospace Doctrine*.

CONCLUSION

Although it is still too early to determine whether *Canadian Forces Aerospace Doctrine* will ultimately be successful, from the outset the manual has been given a better chance than its predecessors. This is mainly because steps have been taken to address the problems that led to the failure of previous doctrine manuals.

In the longer term, other initiatives such as the establishment of CFAWC and the subsequent production of publications such as *The Canadian Air Force Journal* will also play a role in determining the extent of the doctrine's success. Together, *Canadian Forces Aerospace Doctrine* and these other recent initiatives constitute an important step towards reversing the historic tendency of the Canadian Air Force to neglect written theories and doctrines of air power. The nature and timing of these other initiatives also suggests that a tentative doctrinal culture is emerging within the Canadian Air Force at the institutional level. Although it appears that this emergence began with the conduct of the Aerospace Doctrine Study during the early 2000s, this has only become apparent with the benefit of hindsight.

At the time of writing this article, it remains to be seen whether this apparent cultural shift will be transient or enduring. Importantly, there are still several things that need to occur if the Canadian Air Force wants to ensure the permanency of what appears to be a fledgling doctrinal culture. These requirements mainly relate to the need to generate wider support

for recent initiatives. The establishment of CFAWC and the publication of a new doctrine manual indicate institutional level reforms; the need now is to ensure that the generation of ongoing support for these reforms becomes prevalent throughout the Air Force at a "grass roots" level.

First, there is a need to expand efforts to generate (then perpetuate) a culture characterised by air power theoretical development and the written dissemination of ideas. While the publication of *The Canadian Air Force Journal* has been a great start, it has yet to reach its full potential. With a few notable exceptions, substantial articles appearing in previous editions have tended to focus on technological, tactical or operational issues, or alternatively have been authored by personnel posted to CFAWC. While there is nothing wrong with this (indeed, it is an excellent start), the generation of a broader theoretical debate about the role of air power in the Canadian context could constitute a large step towards engendering a lasting written culture conducive to doctrinal success.

Second, despite its comparatively wide distribution and online availability, the release of *Canadian Forces Aerospace Doctrine* has not been followed by a written, public debate about the relevance or utility of its content.[50] Such a debate would constitute an important mechanism for improving the content of future editions, as well as for ensuring that they continue to be located within a sound theoretical framework. Furthermore, wide distribution does not guarantee that the doctrine will be widely read. Regarding this potential problem, the Canadian Air Force may benefit from the Royal Australian Air Force's experience. In that air force, new keystone doctrine manuals are usually launched at high-profile events such as air shows (raising media and public awareness) and their internal distribution is accompanied by a Chief of Air Force order stating that all personnel are to read them.[51]

Finally, now that the Canadian Air Force has a viable keystone doctrine manual, it must ensure that updated editions are regularly produced, in order to maintain the relevance of its doctrine in view of the evolution of Canadian national strategy and changes in the nature of air force operations. In the past, the release of Canadian Air Force doctrine manuals has been followed by long periods of inactivity. Were this to occur again, it would likely contribute to the loss of the Air Force's tentative doctrinal culture. Fortunately, the establishment of CFAWC as a doctrine development "centre of excellence" indicates that such a period of doctrinal inactivity is less likely to occur again. Indeed, the Canadian Air Force's recent undertakings have already put the organisation in a good position to transform its tentative doctrinal culture into something more permanent. Whether this opportunity is taken, however, remains to be seen. ■

Editor's Note: In editing this article, the author's Australian spelling conventions have been maintained.

List of Abbreviations

ADA	Aerospace Doctrine Authority
ADB	Aerospace Doctrine Board
ADCB	Air Doctrine and Concepts Board
CF	Canadian Forces
CFAWC	Canadian Forces Aerospace Warfare Centre
CFC	Canadian Forces College
DND	Department of National Defence
NDHQ	National Defence Headquarters
NDID	National Defence Index of Documentation
RAF	Royal Air Force
RCAF	Royal Canadian Air Force
RMA	Revolution in Military Affairs
USAF	United States Air Force

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Notes

1. Aaron P. Jackson, "The Emergence of a 'Doctrinal Culture' within the Canadian Air Force: Where it Came From, Where it's at and Where to From Here? Part 1: Doctrine and Canadian Air Force Culture Prior to the End of the Cold War," *The Canadian Air Force Journal*, Vol. 2, No. 2 (Summer 2009), 38-46. Available online at http://www.airforce.forces.gc.ca/CFAWC/eLibrary/Journal/Vol2-2009/Iss3-Summer_e.asp (accessed October 19, 2009).

2. For a detailed discussion about the nature of these communities, see Allan English and John Westrup, *Canadian Air Force Leadership and Command: The Human Dimension of Expeditionary Air Force Operations* (Trenton: Canadian Forces Aerospace Warfare Centre Production Section, 2007), 156-227.

3. Desmond Morton, *A Military History of Canada: From Champlain to Kosovo* (Toronto: McClelland & Stewart, 1999), 261.

4. Canada, Air Force, *B-GA-283-000/FP-000 Conduct of Air Operations* (Ottawa: Department of National Defence, 1 June 1981).

5. John Westrop (Chair), "The Evolution of CF Aerospace Doctrine," Annex A to: *Aerospace Doctrine Study: Final Report* (Ottawa: Canadian Air Force, 30 April 1992), 39.

6. Ibid., 39.

7. Westrop, "The Evolution of CF Aerospace Doctrine", 40.

8. "Keystone" is the term used to denote the highest (or sometimes the first) doctrine manual in a series or hierarchy. Usually, the keystone manual contains overarching principles designed to provide philosophical guidance for the conduct of operations. Discussion within other doctrine manuals within the hierarchy, which may be narrower in focus, is usually required to align with discussion within the keystone manual.

9. Canada, Air Force, *B-GA-400-000/FP-000 Basic Aerospace Doctrine* (Ottawa: Department of National Defence, 30 June 1989). This is the same title given to USAF military-strategic level doctrine, indicating the prominent influence this allied air force had on Canadian air force doctrinal thinking during this period.

10. Ibid., chapters 1-3.

11. Westrop, "The Evolution of CF Aerospace Doctrine," 40.

12. Ibid., 41.

13. Markus Mader, *In Pursuit of Conceptual Excellence: The Evolution of British Military–Strategic Doctrine in the Post-Cold War Era, 1989-2002*, Studies in Contemporary History and Security Policy No. 13, (Bern: Peter Lang, 2004), 104.

14. Ibid., 117.

15. A "revolution in military affairs" has been defined as "a paradigm shift in the nature and conduct of military operations," in this case brought about by technological advances since the end of the Vietnam War and evident initially during the 1991 Gulf War. The concept was highly popular during the 1990s, although it has since been brought into doubt as a result of the nature of the post-September 11, 2001 wars in Afghanistan and Iraq. Examples of the work produced as a part of RMA debate include: Andrew Richter, *The Revolution in Military Affairs and its Impact on Canada: The Challenge and the Consequences* (Vancouver: University of British Columbia Institute of International Relations Working Paper No. 28, March 1999); R. Hindley, *Past Revolutions, Future Transformations: What can the History of Revolutions in Military Affairs Tell Us About Transforming the US Military?* (Santa Monica: RAND Corporation, 1999); Alvin Toffler and Heidi Toffler, *War and Anti-War: Survival at the Dawn of the 21st Century* (Boston: Little, Brown & Co.), 1993; Eliot Cohen, "A Revolution in Warfare," *Foreign Affairs*, Vol. 75, No. 2 (March/April 1996), 37-54.

16. David Caddick, "Air Power and the Revolution in Military Affairs" in: Peter W. Gray (Ed.), *Air Power 21: Challenges for the New Century*, Defence Studies (Royal Air Force), (London: The Stationary Office, 2000), 41-67.

17. In the case of the RAF, for example, it has been argued that the role air power played in the Gulf War was the decisive factor in the subsequent decision to produce military strategic level doctrine. See Sebastian Cox and Sebastian Ritchie, "The Gulf War and UK Air Power Doctrine and Practice" in Cox & Gray (Eds.), *Air Power History*, 287-300.

18. Headquarters USAF, *Air Force Manual 1-1, Volume 1: Basic Aerospace Doctrine of the United States Air Force* (Washington DC: Department of the Air Force, March 1992); Headquarters USAF, *Air Force Manual 1-1, Volume 2: Basic Aerospace Doctrine of the United States Air Force* (Washington DC: Department of the Air Force, March 1992); Royal Air Force, *AP 3000 Air Power Doctrine*, (United Kingdom: her Majesty's Stationary Office, 1993).

19. Department of National Defence, *1994 Defence White Paper* (Ottawa: Canadian Government Publishing Centre, 1994), 14.

20. Brereton Greenhous and Hugh A. Halliday, *Canada's Air Forces 1914-1999* (Montreal: Art Global, 1999), 156.

21. John Westrop (Chair), *Aerospace Doctrine Study: Final Report*, Ottawa: Canadian Air Force, 30 April 1992, p. iv.

22. Westrop, "The Evolution of CF Aerospace Doctrine," 41. Stovepiping is "the condition that exists when staff or support personnel forget that they are subordinate to a line commander," instead following instructions from higher-ups within the staff or support branch hierarchy. Richard Szafranski, "Desert Storm Lessons from the Rear," *Parameters*, Vol. 21, No. 4 (Winter 1991-2), 45. See also: Carl H. Builder, *The Icarus Syndrome: The Role of Air Power Theory in the Evolution and Fate of the US Air Force* (New Brunswick: Transaction Publishers, 1994), xiii-xix.

23. Paul Johnston, "Canopy Glint: Reflections on *Out of the Sun: Aerospace Doctrine for the Canadian Forces*" in: Douglas L. Erlandson and Allan English (Eds.) *Air Force Command and Control* (Winnipeg: Canadian Forces Training Material Production Centre, 2002), 83. The document on which *Out of the Sun* was based was titled *ACSP-1 Air Doctrine Manual.* Westrop, "The Evolution of CF Aerospace Doctrine," 41.

24. As will be discussed in the next section of this article, organisational changes made shortly after the publication of *Out of the Sun* resulted in the Aerospace Doctrine and Concepts Board being charged with the development, distribution and maintenance of the Canadian Air Force's doctrine hierarchy, including *Out of the Sun*. As will be seen, the Aerospace Doctrine and Concepts Board did not meet again after its second meeting, held in May 1998, this having the effect of leaving *Out of the Sun* without an organisation to distribute, publicise, update or maintain it. Westrop, 41-42.

25. Johnston, 84. At some point since its original release, *Out of the Sun* has been allocated an NDID number, as the version obtained by this author was labelled B-GA-400-000/AF-000.

26. Canadian Air Force, *B-GA-400-000/AF-000 Out of the Sun: Aerospace Doctrine for the Canadian Forces* (Ottawa: Department of National Defence, 20 July 1997), chapters 8-10.

27. Johnston, 84-85.

28. Paul Mitchell, "The Revolution in Military Affairs and the Canadian Air Force" in: David Rudd, Jim Hanson and Andre Beauregard (Eds.), *Air Power at the Turn of the Millennium* (Toronto: The Canadian Institute of Strategic Studies, 1999), 43.

29. This information was obtained during a series of interviews with Canadian Air Force officers, conducted in May 2007 and August 2008. Interview transcripts are on file with the author.

30. Johnston, 83.

31. Westrop, 41-42.

32. Westrop, v.

33. Ibid., iv-v.

34. Ibid., 32.

35. Ibid., 32-34.

36. Department of National Defence, *Shaping the Future of the Canadian Forces: A Strategy for 2020* (June 1999), available online at http://www.vcds.forces.gc.ca/dgsp/00Native/rep-pub/dda/cosstrat/2020/Defence_Strategy_2020_Ver4_e.pdf (accessed September 10, 2007).

37. Department of National Defence, *Defence Strategy 2020: Formulating the DND/CF Statement of Strategy*, 2. Available online at http://www.vcds.forces.gc.ca/dgsp/00Native/rep-pub/dda/cosstrat/2020/Defence_Strategy_2020_Ver4_e.pdf (accessed September 10, 2007).

38. Canadian Air Force, *Vectors 2020: An Air Force Strategic Assessment* (Ottawa: Department of National Defence, 2000), 1.

39. Director General Air Force Development, *A-GA-007-000/AF-002 The Aerospace Capability Framework: A Guide to Transform and Develop Canada's Air Force* (Ottawa: Department of National Defence, 2003).

40. Canadian Air Force, *A-GA-007-000/AF-004 Strategic Vectors: The Air Force Transformation Vision*, (Ottawa: Department of National Defence, 2004), 44-52.

41. Director General Air Force Development, 64.

42. Canadian Air Force, *Strategic Vectors*, 48-49.

43. [No Author], *Canadian Forces Aerospace Warfare Centre Concept of Operations (Final)*, Canadian Air Force [No place of publication given], 7 June 2005.

44. Canadian Air Force, *B-GA-400-000/FP-000 Canadian Forces Aerospace Doctrine* (Trenton: Canadian Forces Aerospace Warfare Centre, 2007).

45. Ibid., chapter 5.

46. The Army's five operational functions were originally promulgated in: [No Author], *Report No. 01/01: Future Army Capabilities* (Kingston: Directorate of Land Strategic Concepts, January 2001), chapters 3-8. An overview of recent Canadian Army conceptual development is provided in: Aaron P. Jackson, "Moving Beyond Manoeuvre: A Conceptual Coming-of-age for the Australian and Canadian Armies," *Australian Defence Force Journal*, No. 177 (November/December 2008), 85-100.

47. This information was obtained during a series of interviews with Canadian Air Force officers, conducted in May 2007 and August 2008. Interview transcripts are on file with the author.

48. J. L. Christian Carrier, *Transformation of the Canadian Forces: Is Aerospace Power Relevant?* (NSSC 5, Toronto: Canadian Forces College, June 2003), 20.

49. Canadian Air Force, *Canadian Forces Aerospace Warfare Centre*. Available online at http://www.airforce.forces.gc.ca/CFAWC/Index_e.asp (accessed April 20, 2009).

50. In contrast, the release in 1997 and 2001 of keystone doctrine manuals by the Canadian Navy was followed by periods of rigorous academic analysis and debate, which indicated a level of intellectual engagement with the doctrine by members of the Navy as well as the broader naval community. This level of academic and public engagement thus far appears to be missing from within both the Canadian Air Force and the Canadian air power community more broadly. Examples of the debate about Canadian Navy doctrine include: Jeremy R. Stocker, "Book Review: Adjusting Course: A Naval Strategy for Canada," *The Naval Review*, Vol. 86, No. 1 (January 1998), 79; Eric Grove, "Review of Adjusting Course: A Naval Strategy for Canada," *The Northern Mariner*, Vol. 8, No. 2 (April 1998), 134-135; Peter Haydon, "Adjusting Course: Some Observations," *Maritime Affairs*, Spring/Summer 1998, 23-26; Martin Shadwick, "The Leadmark Chronicles," *Canadian Military Journal*, Vol. 2, No. 3 (Autumn 2001), 75. A notable exception to the lack of public, academic analysis of Canadian Air Force doctrine is: Johnston, 83-97; it is a pity there are not more publications of this ilk.

51. This information was obtained during a series of interviews conducted with Royal Australian Air Force officers and civilian employees in August 2007. Interview transcripts on file with the author.

Reprint from the Roundel vol. 3, 1951

Some notes on –

A PHILOSOPHY

of Leadership

By **Squadron Leader G. R. Truemner, A.F.C.**

(So much has been written on this subject that we are not publishing Sqn. Ldr. Truemner's excellent essay in its entirety. We have instead, taken the liberty of selecting excerpts from it which seem to us to summarize the problems of leadership in a terse and unusually vigorous manner. The author, who is at present attending Course No. 15 at the R.C.A.F. Staff College, has had several years' experience as a flying instructor in the R.C.A.F. and was formerly in command of the School of Service Management at Trenton. – Editor [*Roundel*])

Almost everyone in a peace-time military organization can be viewed as a potential war-time leader. Each individual, therefore, owes to himself and his country an obligation to discover what talents are required to provide true leadership. One belief is that leaders are born and not made. Another theory has it that almost any person of normal intelligence can learn to become a leader. Both statements hold considerable truth. Some people do possess a greater natural capacity for leadership that [*sic*] others. The average person, however, can develop and increase his skill as a leader just as he improves his technique as a pilot, a chef, or a mathematician.

DEFINITION

The term "leadership" is related to the field of human relationships where power is exercised over people. One person or group of persons directs; the others, within the particular leadership situation, comply or follow. In human affairs of this nature, a certain friction develops between the will of the one commanding and the responding will of the individuals in the subordinate position. **Leadership is the ability to minimize the friction loss – to influence subordinates to follow instructions because they want to, rather than because they must.**

CONFIDENCE

The function of leadership cannot be developed properly without apportioning considerable thought to the characteristics which the director should possess. A careful study of prominent successful executives of past and present provides the proof that no real

mould exists for a leader. Instead, a full range of spiritual, intellectual, and physical qualifications is revealed, providing contrasts rather than a uniform pattern. One feature, nevertheless, can be stated as being present in all leadership situations – confidence. No real leadership process can be established without an atmosphere of confidence, because:

- the subordinates must have confidence in their leader;

- those to whom the leader is subordinate must have confidence in him;

- and, above all, the leader must have confidence in himself.

Confidence can not be improvised. It is a condition which must be properly initiated and constantly maintained. Paramount among the factors which contribute to this basis of leadership are:

1. The leader's appreciation of the true meaning of discipline.

2. The leader's proficiency in his work.

3. The irreproachableness of the leader's personal example.

4. The leader's understanding of his subordinates.

1. DISCIPLINE

Discipline is systematic training which can instil mutual confidence. Its real purpose is to bind together a number of vastly different individuals into an organized group which works as one unit, to one end, under one leader. Discipline is often confused with compulsion, the instrument to which established authority naturally turns to lend support to its commands; but the effects of compulsion last exactly as long as the club can be applied. Proper discipline is necessary, but there is a vast difference between the discipline that restricts and irritates and the discipline that stimulates confidence and team work.

Discipline, derived from the word "disciple," carries the implication of the attitude of the learner, the person who desires a contributing part in a movement, or philosophy, or religion. Discipline is not punishment or stern rule: it is systematic training which brings about control of mental, moral, and physical faculties.

2. PROFICIENCY

The leader must be skilled in his profession. Such proficiency comes from an understanding of each detail, each task, each responsibility of his employment.

Rudyard Kipling once wrote:

"I keep six honest serving men;
They taught me all I knew.
Their names are What and Why and When
And How and Where and Who."

The individual is master of his work when he knows: what is to be done, why it is to be done [*sic*] how it is to be done, when it is to be done, where it is to be done, and who is to do it. This mastery is the product of constant hard work. The leader must always strive to know more about his military profession than any man under him, because efficiency stimulates the atmosphere of confidence.

The leader must be able to explain or teach his knowledge to others. In fact, many claim that "leader" and "teacher" are synonymous [*sic*] terms. Whether the leader is employed in the office, shop, hangar, or conference room, he will discover that each activity presents the responsibility of teaching someone to do something. The prerequisite to carrying out this function successfully is again that of knowing everything about one's assignment.

The good N.C.O. [non-commisioned officer] or officer is never satisfied with knowing only his own duties well. After mastering his own, he extends his understanding upwards, not to assume the tasks of another, but to integrate his own activities with those related to his. As his Service time lengthens and he becomes experienced, his usefulness expands in proportion to his preparation and development.

3. PERSONAL EXAMPLE

As Winston Churchill once said: "the truly great leader is one who, by his own high example, inspires his followers with such a degree of confidence that they carry out quickly, cheerfully, and thoroughly whatever duties they are called upon to perform." It follows that if a sergeant wants to command the best turned-out flight, or a commanding officer desires to have the finest-looking parade, he himself must be faultless in appearance. If the commander wants his men to "jump to it," he too must be a man of action. If he expects a loyal attitude toward himself, he must set the example by being loyal to his superiors and subordinates. Men will try to mould themselves according to the pattern established by the leader. Men expect their leader to act like a leader, and they unconsciously set a high standard for their superior to attain. The man who cannot handle himself well, will not direct others successfully.

4. UNDERSTANDING SUBORDINATES

If men are to place their confidence in an individual, they must receive something personal in return. That payment can usually be understanding. Fundamental, in learning about a subordinate, is the discovery of how he differs from each of his fellows. At least the following five areas of difference should be studied:

Locality. The leader must consider from what locality a man comes. Town or country – east or west – dissimilar origins may explain dissimilarities in custom, culture, thought, speech, or even humour.

Former Job. Some personnel, accustomed to danger and hard manual labour, find it difficult to place their trust and confidence in another. The ex-clerk may be the opposite. His former employment may have dulled his initiative so that he depends on steady leadership. He, however, will possess habits of patience and endurance.

Temperament. In every group of men there will be the sulky, the good-humoured, the touchy, the lazy, the industrious, the amorous, the loyal, the shy, and so on *ad infinitum*. The N.C.O. or officer who endeavours to to [*sic*] know each immediate subordinate as an individual will be able to get the best from him.

Religion. To a great number of personnel scattered through the Services, religion matters a great deal. Religious faith not only aids morale but also strengthens confidence.

Upbringing. The kind of upbringing a man has experienced – good home, bad home – influences his acceptance of direction.

The more a leader investigates all such differences, the better he will be able to direct his men. No leadership process exists unless "those who follow" are considered and understood.

TO SUMMARIZE

True leadership is founded on confidence, and confidence is inspired by the commander's understanding of discipline, his professional efficiency, his personal example, and his consideration for his subordinates.

Discipline will promote co-operation within the group.

Complete knowledge of his work will permit the leader to direct and instruct.

Personal example of the highest calibre will establish him in correct perspective with his men, and understanding of those men will place them in right perspective with him.

The individual who is vigilant about these factors is a worthy leader – that is, a leader who merits the confidence of his superiors, his subordinates, and himself. ■
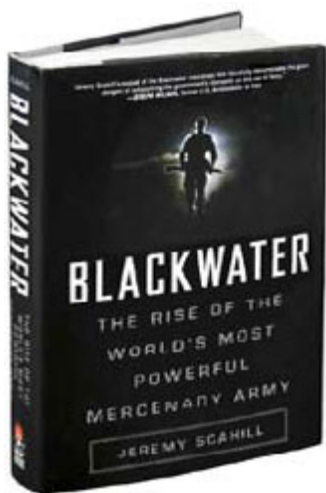
BLACKWATER:
THE RISE OF THE WORLD'S MOST POWERFUL MERCENARY ARMY

BY JEREMY SCAHILL

Review by
Major Gerry D. Madigan, CD1, MA (Retired)

Dwight Eisenhower issued a warning in his closing address as President of the United States in 1960 concerning the growth of the military industrial complex. Eisenhower was concerned for its potential to shape the American economy, its impacts on American liberty and democratic order to the detriment of his citizenry. He sensed that the military industrial complex was capable of subverting United States national policy. It was a power serving its own ends whose growth would be at the expense of the American taxpayer.

Jeremy Scahill's book *"Blackwater – The Rise of the World's Most Powerful Mercenary Army"* echoes Eisenhower's warning. The conjunction of an immense military establishment and a large arms industry is no longer new in the American experience as in Eisenhower's time.

The end of the cold war marked a significant turning point for the military industrial complex. The demand for military expenditure slackened with a concomitant demand for a "peace dividend." The military industrial complex had to restructure in the face of this reality. Governments began looking to the private sector to divest itself of non-essential services, thereby creating a new opportunity for the military industrial complex.

Blackwater, framed in this context, is a tale of the rise of a private company from relative obscurity to preeminence as one of the most powerful private security firms in the United States. The rise came from a desire to privatize government services to do things more efficiently.[1] The theory maintained that "corporations can deliver government services better and at a lower cost than the government can."[2]

Blackwater was one of the new firms willing to take on this opportunity. It evolved from a small company filling a niche market in the provision of specialist training to an international organization providing "boots on the ground and guns for hire," to satisfy a growing demand for vital physical security needs of both private and public concerns in many of the world's hotspots. Scahill contends that Blackwater morphed into one of the world's largest mercenary concerns whose thirst for growth subverts United States policy to the detriment

of world good. Scahill pays particular emphasis to Iraq to back up his compelling case.

Blackwater's role in Iraq comes under the guise of privatization of government services. Scahill argues that Blackwater now plays a more traditional military role with little accountability to local military command and operates beyond the rule of law or rules of engagement employed by the military. In effect there are two players in Iraq who play by two different sets of rules that operate to the detriment and safety of military personnel on the ground.

Scahill paints Blackwater as a loose cannon that has destabilized the Iraqi security situation, which has made the effort to reconstruct the country more difficult. Scahill cites a number of incidents of Iraqi deaths directly attributable to this organization, but whose citizens and government are left without any recourse for legal repercussion under Iraqi law or under United States military law. The contractors have carte blanche to operate, quite unlike the rules applied to military personnel who, in similar circumstances, have been charged with murder and prosecuted for their crimes. Such organizations have alienated an already dispossessed population who see no hope in future under the thumb of a conqueror. Scahill contends that this has fomented rebellion and stiffened Iraqi resistance as a direct result.

Scahill's work draws to our attention problems in the inherent growth in privatized services; notably cost, accountability, rule of law, command and control, and governance. Scahill weaves a well documented tale that warns us that public interests and responsibilities of government are being subverted by the private interests of a few individuals and corporations, and *for profit* (italics the author's for emphasis), which is a detriment to the citizenry of democratic states and can likely destabilize democracy and world order.

Scahill's compelling tale highlights the pertinence and the relevance of Eisenhower's warning made at the end of his presidency to today's citizenry. Scahill posits that what has unfolded in the ensuing years since this historic speech was the very thing that Eisenhower prophesized.[3] This is a highly recommended work and is a valued contribution to the discussion on the hidden dangers in the privatization of government services. ☐

Gerry (GD) Madigan is a retired logistician, Canadian Armed Forces. His career spanned 28 years as a finance officer. His notable postings included time served at National Defence Headquarters, CFB Europe, Maritime Canada and the First Gulf War as comptroller in Qatar. Major Madigan (Retired) is a graduate of the Royal Military College of Canada's War Studies Program.

Notes

1. Jeremy Scahill, *Blackwater: The Rise of the World's Most Powerful Mercenary Army* (New York: Nation Books, a member of Perseus Books Group [paperback ed.], 2008), 20.

2. Ibid.

3. Ibid., 54.

LAST DAYS OF THE LUFTWAFFE:
GERMAN *LUFTWAFFE* COMBAT UNITS, 1944-1945

BY MANFRED GRIEHL

**BARNSLEY, SOUTH YORKSHIRE, ENGLAND:
PEN & SWORD BOOKS LTD., 2009
262 PAGES ISBN 978-1-84832-511-1**

Review by
Major William March, CD, MA

Manfred Griehl is a prolific writer who specializes in examining various aspects of the *Luftwaffe* during World War II. His latest book, *Last Days of the Luftwaffe*, is an extremely interesting and welcome addition to the study of this formidable air power adversary.

The book itself focuses on the last two years of the war when the *Luftwaffe*, far from its glory days in 1939–1941, was in the midst of a downward spiral towards ultimate defeat. Pressed on all sides by growing numbers of Allied aircraft, pummelled from the air with round-the-clock bombing and internally beset by erratic leadership and a dysfunctional organizational culture, the mere fact that the German air force continued to fight until May 1945 was an achievement in itself. However, as Griehl points out in his work, the continued production of aircraft in ever growing numbers coupled with the continued development of new technology in an attempt to regain air power ascendency was remarkable.

For the reader who relishes minute detail on combat units and/or aircraft variants, *Last Days of the Luftwaffe* is a treasure trove. The author provides abundant information on

frenzied improvements to propeller-driven fighters (such as the Me-109 and FW-190 series), the new jet aircraft (such as the Me-262 and the Ar-234) and the formations that flew them. In addition, the book contains a wealth of data on lesser known elements of German air power development and innovation during the closing months of the war. Work on advanced jet-prototypes, the production drawings of which bear an uncanny resemblance to modern aircraft, continued up to the end of the war as did work on new technology such as radio-guided bombs, unmanned aircraft and "flak rockets"—now called surface-to-air missiles (SAMs). And I must comment on the excellent photographs included in this book—the author amply illustrates his discussion with well-chosen archival pictures.

The sheer magnitude and number of programs is staggering. And it speaks not only to the productivity and vision of the German engineers and scientists, but also to the sense of desperation and delusion that seemed to permeate the senior ranks of the *Luftwaffe* as it was slowly being destroyed. The apparent inability of the German military establishment to recognize its limitations and focus on a few manageable/affordable programs is evident

throughout this book. Instead of dealing with reality, the *Luftwaffe* seemed more content to grasp at straws and seek "wonder weapons" with which to snatch victory from a fast approaching defeat.

Matching this surreal belief that superior German technology would somehow save the day was a feeling that national-socialist ideology and a superior sense of duty could also counter Allied air superiority. In chapters entitled "Cannon Fodder" and "Self-Sacrifice," the author describes efforts to produce aircrew with minimal training to fly manned missiles, ram their airplanes into Allied bombers and conduct a variety of "special operations" whereby a young life was to be traded in a suicidal attempt at aerial victory. Perhaps the most chilling chapter is the attempts by the *Waffen-SS* to carve out an *SS*-controlled air force. German reliance on slave-labour and draconian discipline aside, one can only imagine what this change would have meant to the conduct of the air war in Europe.

Although I found this book very interesting, it is not without its flaws. Some are minor, such as referring to an attack on German bombers by 401 Squadron of the Royal Air Force (RAF) when it belonged to the Royal Canadian Air Force (RCAF), and others are major—the lack of sources and a bibliography. More than anything else these latter flaws will hamper researchers and writers who want to delve more deeply into the various materials included in the book. As well, to a certain extent I found the book a bit incoherent as it wandered from subject to subject; however, this may have been unavoidable given the depth and breadth of the subject.

Faults aside, I believe that the book is a worthwhile read. Not only does it give some insight into the last days of our last "peer" air power adversary, it also underscores the lengths to which a determined foe is willing to go—a lesson most appropriate in today's security environment. Perhaps as important, is the need to provide control and oversight for research and development programmes to ensure that they match the organization's needs and resources. This is true whether your environment is constrained by combat or political/economic limitations. In the end, it doesn't matter how many good ideas you have if you lack the resources and time to make them reality. ■

Major William March, a maritime Airborne Combat Systems Officer, is the Academic Liaison Officer at the Canadian Forces Aerospace Warfare Centre. He has taught Canadian defence and air power history at the undergraduate level and is currently pursuing his doctorate in War Studies at the Royal Military College.
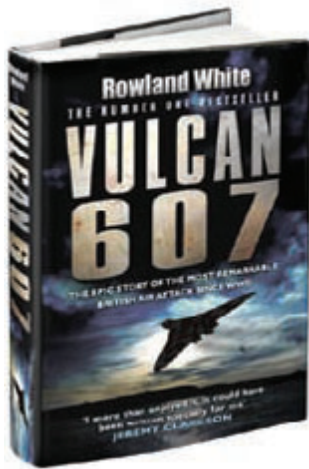
VULCAN 607:

THE EPIC STORY OF THE MOST REMARKABLE BRITISH AIR ATTACK SINCE WWII

BY ROWLAND WHITE

UXBRIDGE:
CORGI BOOKS, 2007
523 PAGES ISBN 9780552152297

Review by
Major Andrew B. Godefroy, CD, PhD

With the twenty-fifth anniversary of the Falkland Islands War having recently passed, a number of new books concerning that conflict have appeared. Among the recent releases are a number of publications focused on the air war, including studies of both fleet air arm as well as bomber operations.

In his book *Vulcan 607*, Rowland White traces the stories of the British bomber crews that were formed into the legendary V-Force and assigned to Operation *Black Buck 1*, an ambitious plan to conduct a strategic long-range attack from the Ascension Islands against Argentinean air power capabilities on the occupied Falkland Islands. The prize for the first mission was Port Stanley Airfield, which consisted of two asphalt runways (918 metres and 338 metres respectively) as well as a number of aircraft and other military air assets. The operation itself was no small endeavour, as the target was 3,800 miles away from the nearest friendly airbase and would require no less than four air-to-air refuelling events on the way to the target. At the time, it was one of the longest long-range bombing missions in history, and its later announcement took the world by surprise.

At the centre of White's book is the crew of Vulcan XM607, one of the two bombers assigned to the first raid. Captained by Flight Lieutenant Martin Withers, XM607 was originally assigned as the reserve aircraft to the mission's primary bomber, XM598 which was captained by Squadron Leader John Reeve. Yet shortly after take-off, Reeve's aircraft developed an unsolvable technical malfunction, and he was forced to return to Wideawake Airfield at Ascension. Withers, the designated backup pilot, would now fly the historical mission.

White's account of the mission is remarkably well presented. He begins by briefly tracing the history and evolution of the Vulcan and Victor aircraft, explaining how their entwined pasts would come together again en route to the South Atlantic. His narrative of the XM607 crew and their colleagues reads like a "Dambusters"[1] tale, and White recounts with great accuracy the difficult and gruelling training to re-master air-to-air refuelling, the technical challenges that occurred, the harrowing night-time voyage to the target, how enemy air defences were avoided at the target and how much of a "near run thing" the whole mission was.

Vulcan 607 is also noteworthy as an in-depth examination of one of the last pre-global positioning system (GPS) era air wars. In 1982, the Vulcan B2s employed in this mission were already considered "last generation," with the oldest aircraft having already banked nearly

22 years of flying. The airframes were not made of stealth materials; there was no simplified GPS navigation. There were no "smart bombs"; however, a later mission did employ AGM-45 Shrike missiles against Argentinean air defences. Vulcan 607 carried twenty-one 1,000-pound general-purpose bombs, struck the Port Stanley Airfield from 10,000 feet and employed its H2S radar to guide the munitions toward their target.

Included with the book are numerous useful maps, diagrams that explain the in-air refuelling plan as well as technical drawings and specifications for the main aircraft involved in the mission. Finally, two full-colour sections of photos give the reader plenty of companion material to consider and enjoy while reading

this history. Overall, very well researched and well supported with firsthand interviews and accounts, White's *Vulcan 607* makes both an interesting and enjoyable read for those interested in either the Falkland Islands War or the late cold war air power era in general. ■

Major Andrew Godefroy, a combat engineer, is currently assigned to the Directorate of Land Concepts and Designs at Canadian Forces Base Kingston. In his spare time, he serves as the editor of *The Canadian Army Journal*, the JADEX Occasional Papers series and the Canadian Army Reading List.

Notes

1. The nickname given to the Royal Air Force's 617 Squadron.
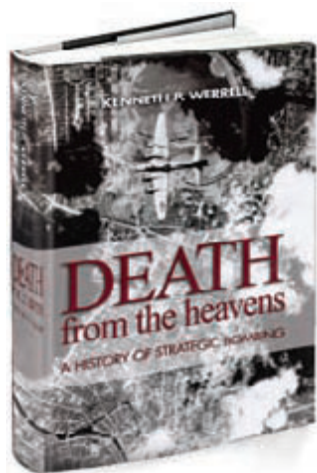
DEATH FROM THE HEAVENS:
A HISTORY OF STRATEGIC BOMBING

BY KENNETH P. WERRELL

ANNAPOLIS:
U.S. NAVAL INSTITUTE PRESS, 2009
332 PAGES ISBN 978-1-59114-940-8

Review by
Dr. James R. McKay

Death from the Heavens is another work by the well-known scholar of air power, Dr. Kenneth Werrell. Some of Werrell's other works include studies on ground-based air defence, air power in the Korean War, cruise missiles and strategic bombing. Werrell graduated from the United States Air Force Academy in 1960 and flew WB-50 Superfortresses (weather reconnaissance variant) before obtaining his MA and PhD from Duke University.

The book is unusual. First, one would not normally expect the Naval Institute Press to publish a work devoted to a topic that has been the raison d'être for the existence of a number of the world's air forces. This will be discussed in greater detail later in the review. Second, the author stated that this was the result of a career's worth of research on aviation history with a focus on the United States Army Air Forces (USAAF) and United States Air Force (USAF). This could lead one to draw

the conclusion that this might be his final work. Last, the book is devoted to answering the question of whether strategic bombing has fulfilled its promise; is it decisive in winning wars and why?

Werrell addresses the perpetual definitional issues surrounding air power and strategic bombing early in the book. He uses a very inclusive definition for the term "air power," stating that it would ". . . include all uses of air vehicles as well as missiles and space vehicles . . ."[1] This conveniently focuses on the use of the aerospace medium as opposed to more parochial definitions, which set the stage for some of the later chapters. Interestingly, he uses a negative definition for the term "strategic bombardment":

> It is neither tactical operations, the attack of enemy troops (close air support), nor interdiction, the attack of enemy supplies that sustain the troops. Instead, strategic bombardment strikes the enemy's home- land, bypasses its armed forces, and directly hits the source of its power, be it physical targets, such as war industry (munitions' plants, for example, economic targets (fuel, transportation, or electricity), or psycho- logical targets (the enemy's civilian morale).[2]

This definition relies on the combination of the attacker's intent and the nature of the target set to delineate between the tactical and strategic. This is a useful definition given the stated purpose of the book—to test the promise of decisiveness in war.

Werrell deserves praise for his methodo- logical honesty. He notes early in the work that the sections on non-American air forces, such as the Royal Air Force (RAF), the *Luftwaffe* or Soviet Air Force, relied on secondary sources, whereas the Americans relied largely on primary sources. This is reasonable given that he had a much greater degree of access to archives in the United States than he would have overseas. The methodological candour is tied to the admission that the work focuses

largely on the American experience as opposed to others. While some might object to this, given the history of strategic bombing, the most prolific practitioner over time has been the United States.

The book traces the evolution of the ideas, technology and application of both to the practice of strategic bombing. While objection- able to some, the coverage of the well-trodden territory of the early history of flight in a work devoted to strategic bombing is necessary to maintain the continuity of the relationship between the ideas and technology. Werrell makes this point well in the early chapters by tracing the development of the early air raids in the First World War, such as the Zeppelin raids or efforts to strike at Germany. Due to the technological limitations on range and the ability to deliver ordnance accurately to targets, the majority of the so-called strategic bombing efforts were tactical in nature. Yet the idea of strategic bombing survived and came to be encapsulated in the doctrines of at least one air force in Europe.

The interwar years saw the growth of aviation, rapid development of technology as well as the transmission of persistent beliefs about strategic bombing (i.e., the effect on civilian morale). Werrell implicitly argues that the interwar experience made the larger campaigns of the Second World War possible. This argument was subtly presented, but was clear nonetheless; the transition over time to larger metal monoplanes increased the range and payload of bombers and this came at the same time as the ideas of various advocates of strategic bombing came to light.

Werrell devotes the majority of the book to the Second World War and separates the experiences of the major air forces (the *Luft- waffe*, the RAF, the USAAF in Western Europe [as part of the Combined Bomber Offensive] and the USAAF in the Pacific Theatre) into specific chapters. The reason for the focus on this period is that it represents the application of strategic bombing in a period of total war

and places the various efforts into context. For example, Werrell describes the *Luftwaffe*'s efforts as "puny" and is right to do so given the relative tonnages of bombs dropped by the *Luftwaffe* (78,000 tons) compared to the combined efforts of the Allies' air forces (1.4 million tons).[3]

Like a number of others, Werrell treats the British (and by default, the Commonwealth) and Americans in conjunction despite their different approaches to strategic bombing. He reserves judgement on the effectiveness of either campaign until he discusses both, and then the Combined Bomber Offensive. He notes that while strategic bombing efforts have been described as "decisive" in other fora, he argues that the primary, but not the only, contribution was to focus the *Luftwaffe*'s efforts on air defence and ultimately destroy it, thus removing one of the key enablers of German combined arms warfare on land.[4] He argues that the sheer costs in aircrew and planes means that strategic bombing proved to be a war of attrition in the skies over Western Europe, and ultimately did not support the promises of its advocates.

He then proceeds to examine the strategic bombing campaign in the Pacific Theatre. This, he argues, was more indicative of what strategic bombing could achieve, but this was due to specific conditions. For example, the nature of Japanese urban construction and planning made them vulnerable to the effects of incendiary bombing, the Japanese air defences were not as extensive as those in Germany, and the effects of the blockade against Japan all made the country more vulnerable. The primary and secondary effects of bombing were more significant as a result. Werrell is careful to state that it was more "efficient," but does not state that it was effective, in contrast to the USAAF's official history. His argument is simple: Japan was a case where the country became demoralized as a result of the strategic bombing.[5]

The next chapters in the book focus mainly on the effect of technological developments like the transition from propeller-driven bombers to jets and/or missiles, with some discussion of the conflicts in Korea and Vietnam. Werrell raises the argument that a series of technological developments effectively blurred the distinctions between tactical and strategic activity in the air. A number of innovations coincided to change the nature of strategic bombing, such as atomic weaponry, radar, jet propulsion, and air-to-air refuelling. The last two had the greatest influence by enabling global reach and signalling the death knell of propeller-driven bombers. After the Korean War, jet propulsion became the standard for bomber aircraft and Werrell spends a significant amount of time in the book discussing various development programs and efforts.

The chapter on Vietnam is a useful yet succinct treatment of the furtive and more deliberate American attempts to deal with North Vietnam through strategic bombing. Of greatest interest are comments about the two *Linebackers*. First, he argues that *Linebackers I* was primarily an interdiction campaign, and while successful, it was not necessarily strategic.[6] Second, *Linebackers II* was not as successful as normally described given the number of relatively limited objectives and the number of American casualties, of which the majority were due to advancements in ground-based air defence weaponry.[7]

The author spends the rest of the book on technology. While he could be excused for this due to a succinct yet detailed treatment of the topic, the omission of even a short discussion of attempts at strategic bombardment through missiles during the Iran-Iraq war is somewhat of a gap. His final chapter is the most interesting. While he addresses the end of the cold war and its effects, he also discusses John Warden's theories and their application during the 1991 Gulf War. He discusses the post-cold war era briefly to illustrate the importance of air power in a series of crises, but the choice of term is critical. Where there were some attacks against strategic targets, these were not cases of strategic bombing and this may augur for the future of the practice.

The conclusion addresses the question posed earlier in the book. Thoughtfully and understanding his potential audience, Werrell seeks to ask if the idea of strategic bombardment had been put to a "fair test." He argues that this only occurred in the Second World War, as it was the last "total" war. The results, however, cast doubt on the idea of wrecking morale and the applicability of the economic node theory. He concludes by noting that despite the series of technological advances, strategic bombing has not delivered on the promises of its advocates. The reasons for this, he argues, are political restraint and inadequate intelligence. This suggests that Werrell believes that strategic bombing would work best in conditions of little restraint and significant intelligence effort, hence his observation on total war. The key to victory, he argues, was air power's ability to be flexible and adapt to a series of constantly changing situations.

Overall, the book is definitely worth reading to get a holistic view of the ideas and varying means by which strategic bombing has been carried out. The discussion of technological matters is much stronger than the discussion of the ideas and given the author's previous works, this is hardly surprising. The balance of both is useful, and as Werrell himself notes, there are far fewer cases available of the practice of strategic bombing by which to assess the promises. A fair judgement is only obtainable through the full story of the ideas, the technology and their application over time. Werrell provides us with a great view of all three. ∎

Doctor James McKay is an Assistant Professor of Political Science and the Director of Faculty Services at the Royal Military College of Canada.

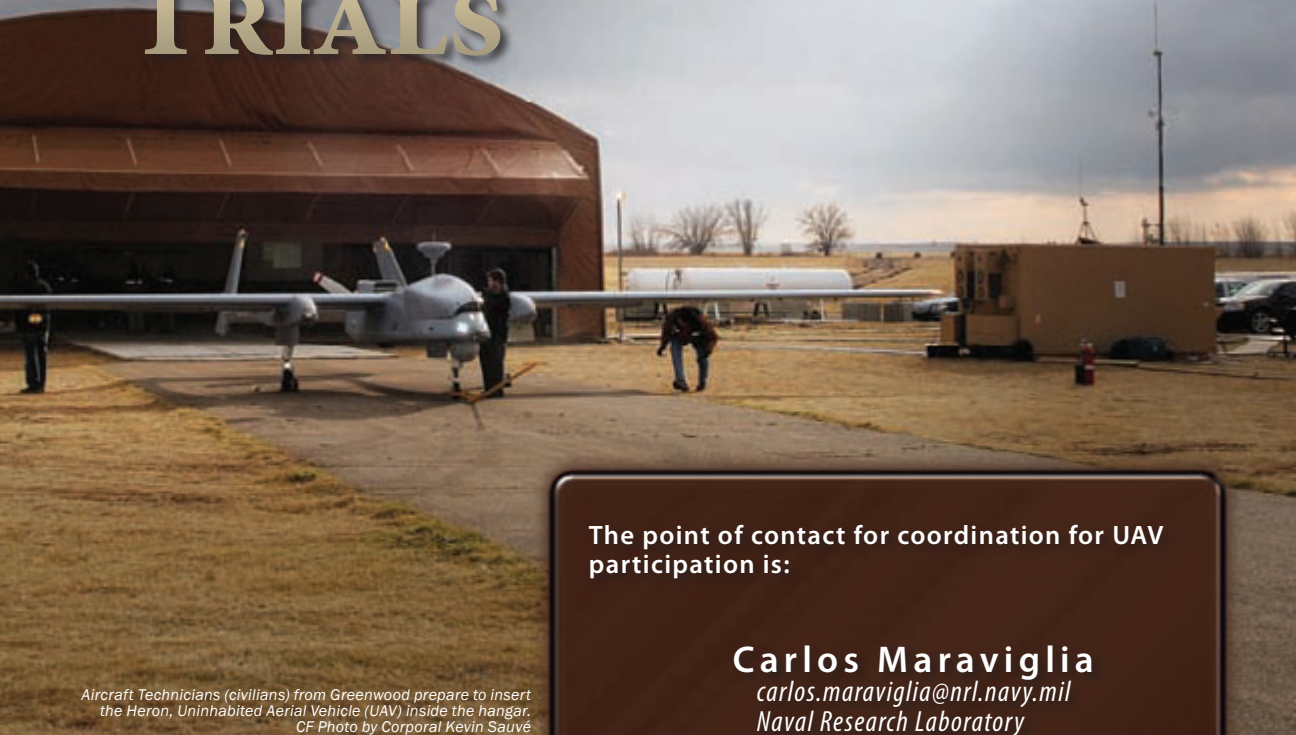## List of Abbreviations

RAF	Royal Air Force
USAAF	United States Army Air Forces
USAF	United States Air Force

Notes

1. Kenneth Werrell, *Death from the Heavens: A History of Strategic Bombing*, (Annapolis: Naval Institute Press, 2009), xv.

2. Ibid., xv.

3. Ibid., 127.

4. Ibid., 125.

5. Ibid., 153.

6. Ibid., 220.

7. Ibid., 224.

2010 UNITED STATES / CANADA UAV TRIALS

Aircraft Technicians (civilians) from Greenwood prepare to insert the Heron, Uninhabited Aerial Vehicle (UAV) inside the hangar.
CF Photo by Corporal Kevin Sauvé

The point of contact for coordination for UAV participation is:

Carlos Maraviglia
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Naval Research Laboratory
Tel: 202-404-7686
Cell: 202-445-1147

North Atlantic Treaty Organization (NATO) members of the Joint Capability Group – Unmanned Aerial Vehicles (JCGUAVs) have been invited to send UAVs to the 2010 United States / Canada trials. The trials are open to all members of the North Atlantic Treaty Organization (NATO). Sea-based UAV systems are welcome, but land-based UAVs are expected to be in the majority of UAV types available for the trials. The trials will be conducted near Halifax, Nova Scotia, Canada. The airspace is expected to accommodate all sizes of UAVs. The time frame for the exercise is the third week of June 2010.

The trials provide a good opportunity to demonstrate interoperability and sea surveillance with UAVs. The operations may also provide the opportunity to test civil/military cooperation for UAV employment as well as monitoring seaborne approaches in a variety of operational scenarios.

PUSHING THE ENVELOPE

A NETWORKED VISION; FROM KNOWLEDGE SCRIBES TO KNOWLEDGE HERDERS

by **Chief Warrant Officer Ralph Mercer, CD**

"The important thing is not to stop questioning. Curiosity has its own reason for existing."[1]

Albert Einstein (1879-1955)

The list of challenges facing the Air Force is long; infrastructure, aircraft procurement, future security environments, recruiting and budgetary constraints, just to name a few. There is a common thread that underpins the search for solutions to all these serious problems. This common thread is the computer network that all Air Force personnel use; it is from this network that we source the solutions to the problems that affect us. We must question whether this network that supports all Air Force activities can provide the necessary knowledge transfer, collaboration and flexibility necessary to generate the ideas and innovative solutions needed. Sadly, the answer to that question is no, we are quickly being left behind in network development and concepts.

There is a growing digital divide[2] between the collaborative, innovative and user friendly networks available to the public and our rigid outdated military networks. If this capability gap is not addressed we will not be able to use or exploit future advances in computer network applications, technologies or innovations. Air Force personnel work in a network environment that boasts email saturation and no formal knowledge capture system or useful search engine. In the name of security we have disabled the majority of our programs and communication devices to the point of rendering them useless. The fallout from this one-size-fits-all network is the creation of virtual and cerebral information silos.

Demographically, we are an aging force, presenting us with the added problem of corporate knowledge rust-out. It is essential that we develop a knowledge capture system that preserves a generation of tacit knowledge. In most locations we still have an oral tradition of job handover and transferring of specialized knowledge to personnel as they take over new positions. There is no Frequently Asked Question (FAQ) or knowledge management database made available, so we continue to relearn the majority of our mistakes. This is a very precarious way of carrying out business in a knowledge environment if you consider that most of our staff workers are pensionable and one deep.

One of the most serious secondary effects of this network environment is that the network is looked upon, not as a vehicle for success, but rather as a necessary evil that must be used. We need to change that reference point, and develop a culture that uses the network as a tool for success and shares knowledge pan-Air Force. Most importantly, we need to change from being knowledge scribes to knowledge herders.

To make this shift in perception, we need to stop focusing on the technology and start focusing on how we want our personnel to collaborate and share knowledge across the network. More importantly, involve industry experts in the development from the beginning. We also need to remember that collaboration and knowledge management are not new, we practice them every day. It is the conversations we have with our coworkers, the social and interpersonal networks we build, the information we search for and the data we collect. Computer networks can either enhance or deter collaboration, and we need to build one that excels at making us collectively smart. By recording the principles and basic tenets that describe the Air Force network of the future in a capstone document, we will have taken the first steps in the codification of the values that will guide the desired community of practice[3] within the Air Force.

To achieve this fundamental shift in work we need to start with a blank sheet of paper and discard our preconceived notions of hierarchical information flow. We want to foster collaboration, speed up the retrieval of knowledge and simplify the process of recording information while encouraging conversations and social networking.[4] It is the ability to collaborate effectively on the network that will change us from document producers to knowledge managers. We will go from small, secluded teams scribing away on a document to a dispersed community of stakeholders collaborating and sharing in the progression of ideas. This paradigm shift to social collaboration will free people to manage their functional areas and give them the time to research concepts and innovations being created in other militaries and industry world-wide.

The development of blocks of information by stakeholders and their assembly, like Lego-blocks, into a knowledge management database, opens the door to exciting possibilities for the Air Force. It will allow us to exploit the "all-source" approach and invite industry, academics and other government departments to easily and seamlessly contribute to the development of doctrine and best practices regardless of physical location. Doctrine and training organizations should have evergreen documents.[5] Users and stakeholders are invited to contribute on a continual basis to the document development; as the content of each modular block of information becomes distinct it is seamlessly integrated into the master document. This modular approach allows all functional areas to be symbiotically linked. As one modular piece changes, the updates are flagged across the network ensuring that all data remains consistent. Using the collective knowledge of the Air Force community, observations and problems can be converted into lessons learned in a minimal amount of time and disseminated throughout the network instantaneously. The relevance of any lessons learned program is dependent on it being community driven, open sourced and devoted to finding solutions at the lowest possible level without layers of bureaucratic involvement.[6]

To ensure knowledge management is culturally supported and encouraged (enforced, if necessary), data must be stored in open formats, remotely accessible and optimized for search engine optimization (SEO).[7] The act of retrieving that information needs to be flexible and customizable. Information that is only stored and cannot be easily accessed or researched is of no value. Only when it is used to improve operational effectiveness and decision making does it begin to have value. Picture a resource management clerk after setting up a Really Simple Syndication (RSS)[8] feed, receiving notices whenever there is a change to a DAOD [Defence Administrative Orders and Directives] or to human resources policies. This will allow changes in best practices and information to cascade across the network to users who want the information in real time. Traditional information gate keepers at all levels can no longer stockpile information; it needs to be shared and made available to all. It will be the different users and organizations at all levels that will take this seemingly unrelated information and combine it in new and exciting ways to generate innovative ideas and solutions.

We don't all think and work the same way and we don't all need the same information; individuals must be able to shape their desktops to suit individual work habits and work requirements. This will not only boost productivity, but work satisfaction. Personal desktop and email should be linked to the person, not the job location, and not suspended when posted or deployed. While the desktop and user profile belongs to the user, the FAQs about a particular job and the knowledge management aspects of that position should be linked to the terms of accountability and researchable. The structure of the network must be fluid and adaptive to allow the forming of ad hoc collaborative groups on the fly. If we have to wait for permission, opportunities are lost. The ability to use the knowledge-capture and collaboration aspects of the network should be as easy as sending an email or logging on to micro-blogging[9] or a workstation video conference feed.

Enterprise programs are not always the solution. Smaller applications that share and interact seamlessly consume less overhead and are easier to use than many larger one-size-fits-all programs. We should not lock ourselves into using monolithic, expensive proprietary programs; open source is both free and robust, with a large support community that can easily adapt programs to custom

fit operational requirements. Maximizing the use of open source products will free up expensive, recurring licensing fees that can be reinvested in the network to ensure we stay on the cutting edge.

To ensure that the capabilities of the network are used and exploited, the network and programs that make it all happen have to be dirt simple to learn. The network should look and feel very similar to the programs we use on the internet at home; no one can afford extra training costs and user down-time. The user-driven interface[10] should be designed around the way we want to work, we should not have to shape our work habits to fit a product. The entire network should be web compliant; it must be a living, flexible structure that upgrades easily, vice a rigid and proprietary system. Video conferencing and micro-blogging must be available at all work-stations. Collaboration and social networking are to be encouraged. We want people to talk, to share, to be open with their knowledge and to be a team helping each other. Support for mobile devices is imperative. Many of our knowledge workers live on the road, and the mobile network should be fast, support multimedia and wireless. Briefcases full of staff papers can be carried on a single e-Book reader, presentation and speaking notes can be reviewed on smart phones and everything should be updated wirelessly as we travel. The need for security on a military network is acknowledged; it should be flexible, scalar and adapted to the role of the organization it serves. We can no longer afford to be restricted by a rigid, one-size-fits-all implementation.

To make this all happen we need to establish a culture of digital knowledge management[11] and instill a desire to reach out for information, as well as share it. To do this, the buy-in at the top must be evident. Leadership at all levels must be the early adopters, demonstrating an environment where collaboration is not only encouraged, but expected. The successes and the benefits of collaboration must be made evident. The success of our adoption of new concepts and computer innovation will be critical to the Air Force's ability to attract and employ the "digital native"[12] generation. They will be our future workforce and we need to have in place a network structure that will capitalize on their unique perspective and provide them with the digital work environment that they consider the basic tools of life.

The implementation of this network overhaul needs to start now, and to do this we need to pick a test bed for the concept and start designing the process. I can think of no better place to start than at the Canadian Forces Aerospace Warfare Centre (CFAWC). One of its roles is to provide the Air Force with the knowledge to acquire the right capabilities and develop appropriate doctrine to successfully conduct aerospace operations as we move into the future. In the spring of 2010, CFAWC will move into its new state-of-the-art green building. This move could also be symbolic of the move to implement a new and truly interactive, collaborative knowledge network for the Air Force.

When we ask, "is the energy and resolve required to resuscitate and innovate our network worth the effort?" we should remember that without a fluid, interoperable and collaborative network we will never be able to stay inside the decision loop of our adversaries and ahead of our problems. It will be the speed and ability to adapt across the network, to use our collective knowledge and generate ideas that will be the Air Force's greatest non-kinetic tools for success.

Ralph Mercer is the Canadian Forces Aerospace Warfare Centre Chief Warrant Officer (CWO). He studies internet culture and how people interact with computer networks and is a strong advocate of social media, open source software and a member of the Canadian Internet Registry Association. CWO Mercer can be followed on twitter @ ralphmercer.

List of Abbreviations

CFAWC	Canadian Forces Aerospace Warfare Centre
CWO	chief warrant officer
FAQ	frequently asked questions
RSS	Really Simple Syndication
SEO	search engine optimization

Notes

1. Available online at http://www.famous-quotations.com/asp/acquotes.asp?author=Albert+Einstein+%28 1879%2D1955%29&category=All&curpage=7 (accessed September 28, 2009).

2. Available online at http://en.wikipedia.org/wiki/Digital_divide (accessed September 28, 2009). The term digital divide refers to the gap between people with effective access to digital and information technology and those with very limited or no access at all. It includes the imbalances in physical access to technology as well as the imbalances in resources and skills needed to effectively participate as a digital citizen.

3. Available online at http://en.wikipedia.org/wiki/Communities_of_practice (accessed September 28, 2009). The concept of a community of practice (often abbreviated as CoP) refers to the process of social learning that occurs and shared sociocultural practices that emerge and evolve when people who have common goals interact as they strive towards those goals.

4. Available online at http://en.wikipedia.org/wiki/Social_networking (accessed September 28, 2009). Social networking has encouraged new ways to communicate and share information. Social networking websites are being used regularly by millions of people.

5. Available online at http://en.wikipedia.org/wiki/Document (accessed September 28, 2009). Web analogs of traditional paper documents like a newspaper column have taken on a dynamic character due to the impact of technology enabling the addition of comments from readers. The document will increasingly become "virtual", bringing up-to-date information from various sources in one container (a la "mash-up") - as such it will be kept evergreen.

6. Available online at http://en.wikipedia.org/wiki/Crowdsourcing. Crowdsourcing is a distributed problem-solving and production model. Problems are broadcast to a group of solvers in the form of an open call for solutions. Users--also known as the crowd--typically form into online communities, and the crowd submits solutions. The crowd also sorts through the solutions, finding the best ones.

7. Available online at http://en.wikipedia.org/wiki/Search_engine_optimization (accessed September 28, 2009). SEO is the process of improving the volume or quality of traffic to a web site from search engines via "natural" ("organic" or "algorithmic") search results.

8. Available online at http://en.wikipedia.org/wiki/RSS_(file_format) (accessed September 29, 2009). The RSS reader checks the user's subscribed feeds regularly for new work, downloads any updates that it finds, and provides a user interface to monitor and read the feeds.

9. Available online at http://en.wikipedia.org/wiki/Micro_blogging (accessed September 29, 2009). Microblogging is a form of multimedia blogging that allows users to send brief text updates or micro-media such as photos or audio clips and publish them, either to be viewed by anyone or by a restricted group that can be chosen by the user.

10. Available online at http://en.wikipedia.org/wiki/User_interface_design (accessed September 29, 2009). The goal of user interface design is to make the user's interaction as simple and efficient as possible, in terms of accomplishing user goals—what is often called user-centred design.

11. Available online at http://en.wikipedia.org/wiki/Knowledge_management. KM efforts typically focus on organizational objectives such as improved performance, competitive advantage, innovation, the sharing of lessons learned, and continuous improvement of the organisation. KM efforts overlap with organizational learning, and may be distinguished from that by a greater focus on the management of knowledge as a strategic asset and a focus on encouraging the sharing of knowledge. KM efforts can help individuals and groups to share valuable organizational insights, to reduce redundant work, to avoid reinventing the wheel per se, to reduce training time for new employees, to retain intellectual capital as employees turnover in an organization, and to adapt to changing environments.

12. Available online at http://en.wikipedia.org/wiki/Digital_native (accessed September 29, 2009). A digital native is a person for whom digital technologies already existed when they were born, and hence has grown up with digital technology such as computers, the internet, mobile phones and MP3 [MPEG-1 Audio Layer 3].

Former Chief of the Air Staff

MESSAGE

LGen A. Watt, Gen W. Natynczyk, and LGen A. Deschamps at CAS Change of Command ceremony
CF Photo

The Race Continues

By Lieutenant-General Angus Watt
Change of Command Speech October 2009

LGen A. Watt receives (left) a gift from LGen A. Deschamps (right) at CAS Change of Command ceremony. CF Photo

Recently, I passed command of the Air Force to Lieutenant-General André Deschamps and retired after 37 years of service in the Canadian Forces. These turning points in one's life are always an opportunity to look both at the past and into the future—where we have come from and where we are going.

I appreciated the attendance of so many at the change of command parade, held at the Canada Aviation Museum in Ottawa on October 1. These types of ceremonies—filled with pomp and circumstance, ritual and history—place appropriate emphasis on the importance of leadership, the challenges of command and the seamless continuity we strive for as the baton passes from one generation to the next.

I believe that "baton" is the right metaphor because command at this level is analogous to a relay race, rather than a sprint or a marathon. Each Chief of the Air Staff takes the baton —the job—from his predecessor and carries it for awhile to move the Air Force forward. We all try to pass the baton to our successors in better shape than we found it.

During my tenure, I tried to make the Air Force a better organization, a better workplace and a more effective operational entity of the Canadian Forces. Some of the initiatives that my predecessors started, I finished. Many of the initiatives that I have started will be completed by my successors.

For instance, my predecessor, Lieutenant-General Steve Lucas, began the acquisition of our strategic airlifter, the CC177 Globemaster III. I was privileged to take delivery of this marvellous aircraft as one of my first official duties as Chief of the Air Staff. Similarly, shortly before my retirement we signed a contract to acquire new CH147F Chinooks; another Chief of the Air Staff will have the pleasure of taking delivery of them.

In other words, to continue the analogy of a relay race, simply measuring the accomplishments of the Air Force during the command of a single Chief of the Air Staff really doesn't encompass what the job is all about. Much of what any individual Chief of the Air Staff achieves is the result of a line of successive Chiefs of the Air Staff. It is also the result of the hard work of thousands of Air Force members who have contributed in their own way to the progress of the Air Force.

In the end, I hope that I've made a difference in the Air Force and to its members, and I hope that I've polished the baton a little before passing it onward.

I believe your Air Force has achieved much over the past few years. When I speak of these successes, some might suppose I am boasting. I am proud—not of my personal efforts, but rather those of the entire Air Force team, indeed the entire National Defence team, because they richly deserve the credit.

I have enjoyed my two years as Chief of the Air Staff and I wish all of you—supporters of the Air Force, members of the Air Force, our civilian employees and your families—the very best.

I would also like to thank those that have helped me during my time in the Air Force and during my tenure as Chief of the Air Staff. In fact, I should thank literally thousands of people with whom I've served over these 37 years who helped me, who guided me and who supported me. To all, thank you. I will always remember what you did for me.

As I "fly off into the sunset" I am very confident about the future of the Air Force. We have begun to modernize and refurbish. We have great people and strong leaders at every level. You have a tremendous new Chief of the Air Staff with Lieutenant-General André Deschamps. He has the experience, the skills and the talents to take the Air Force to new heights.

As for my own plans, I have nothing firm lined up. But I will continue to be a strong supporter of the men and women of the Canadian Forces because I know what a national treasure this institution is.

Per ardua ad astra

Chief of the Air Staff
MESSAGE

Canada's Air Force will be
"BEST IN CLASS"

By Lieutenant-General André Deschamps
Change of Command Speech October 2009

LGen A. Deschamps signs the Change of Command certificate. CF Photo

I t is truly an honour and a privilege to be the new Chief of the Air Staff and Commander of Air Command.

The change of command parade took place October 1, 2009 at the Canada Aviation Museum in Ottawa. Since we are celebrating the 100th anniversary of the Centennial of Flight as well as the 85th birthday of Canada's Air Force this year, it was fitting that the ceremony took place amongst aircraft that trace the history of Canadian aviation—and Canada's Air Force—from its very beginnings.

As those assembled for the ceremony looked at those historic aircraft, it was very clear that we have a proud Air Force history. And it is equally clear that we have a bright Air Force future.

Thanks to the dynamic leadership of my predecessor, Lieutenant-General Angus Watt, as well as Chiefs of the Air Staff who preceded him, and thanks to the support of the Government of Canada, we have made many advances in recent years.

MANY RECENT ADVANCES

To name just a few, we have fielded the new Globemaster heavy airlifters that are performing stellar work in the Afghanistan theatre, at home, and elsewhere in the world. We will soon see the arrival of new Hercules transport aircraft to replace the oldest airframes in our current Hercules fleet, and, most recently, we signed a contract for new Chinook helicopters that will meet our medium-to-heavy lift helicopter requirements for years to come. We also established the Air Wing in Afghanistan, which provides vital support to Canadian and coalition forces in theatre.

My intent, therefore, is to build on the successes achieved by my predecessors, in line with the Government's Canada First Defence Strategy.

My key areas of focus are straightforward: operations, equipment and people.

SUCCESS IN OPERATIONS

My immediate priority is success in operations. We will maintain our tempo in Afghanistan, support the 2010 Olympics in February, and, in a few short months afterward, support the G-8 Summit. Of course we will also maintain our focus on all our operations at home and abroad. Some of these domestic and international operations are high profile, while others "fly below the radar."

But rest assured that they all have an effect. You only have to look at the impact that a single Sea King helicopter and its crew—known as Palomino 16—had when it deployed with Her Majesty's Canadian Ship WINNIPEG on counter-piracy operations near Somalia earlier this year.

Over the next several months, we will ensure that all our operational priorities are balanced and that we continue to have positive effects during this very critical period.

INTEGRATION OF CAPABILITIES

My second priority is the integration of new capabilities. We have new Hercules, Chinooks and Cyclones arriving very soon. We will need to integrate them as rapidly, as effectively and as seamlessly as possible into our current capabilities.

At the same time we are laying the foundations for new fleets in the future—fleets such as fixed-wing search and rescue aircraft, unmanned aerial vehicles, our next generation fighters, and multi-mission aircraft to replace the Aurora.

THE MOST IMPORTANT RESOURCE

My most mission-critical element is also my most important resource—our people.

Without the dedicated, professional men and women of the Air Force, we would not be where we are today. They provide the knowledge, the drive and the leadership to move our initiatives and operations forward.

We will continue to work towards ensuring our people have the best possible training and careers, and the best possible personal and family support that the Forces can deliver.

I truly value each and every person in the Air Force. We need their expertise, their knowledge, and their mentorship of our new members—especially now as we integrate our new technologies and capabilities in this time of high operational tempo.

I am also dedicated to attracting and welcoming new members to the Air Force family. Our serving members are the key to transferring knowledge to them and building their pride in our profession and heritage.

All of us in the Air Force are partners in providing the most exciting and gratifying career and life experience that anyone can aspire to.

BEST IN CLASS

Adding these three priorities together, my overall goal is to be "best in class" for our size. Pound for pound, person for person, we will deliver world-class service in terms of operational effect, people, training and resources. We will marry high technology with the right resources, and great people with great training.

We have always had tremendous spirit in the Air Force. Now—with the way ahead mapped out in the Canada First Defence Strategy—we have a positive commitment to the resources that will enable us to do the job. I am encouraged by this; everyone in the Air Force and all Canadians should also be encouraged.

In closing, we have many opportunities and a huge range of rewarding careers in the Air Force—from firefighter to fighter pilot. I want to imagine a young man or woman looking to the sky and thinking "that's the place for me." I hope all members of the Air Force will join me in telling that person: "now is the time to make your dream a reality. You can make a real difference to your fellow Canadians and to the world."

For those serving in the Air Force and those who are thinking of a career with the finest organization in the country, remember this: the future can be yours in Canada's Air Force.

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