

SUMMER 2009
VOL. 2, NO. 3

THE CANADIAN

AIR FORCE JOURNAL



Photo: WO Serge Peters



PRODUCED BY
THE CANADIAN FORCES
AEROSPACE WARFARE CENTRE

IN THIS ISSUE:

**GLOBAL MOVEMENTS
AND OPERATIONAL
SUPPORT HUB CONCEPT:**

GLOBAL REACH FOR
THE CANADIAN FORCES

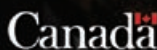
GÖTTERDÄMMERUNG:

THE TWILIGHT OF THE *EXPERTEN*

**THE EMERGENCE OF A
“DOCTRINAL CULTURE”
WITHIN THE CANADIAN
AIR FORCE:**

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

AND MUCH MORE!



National
Défence

Défense
nationale

THE CANADIAN AIR FORCE JOURNAL is an official publication of the Chief of the Air Staff and is published quarterly. It is a forum for discussing concepts, issues and ideas that are both crucial and central to aerospace power. The *Journal* is dedicated to disseminating the ideas and opinions of not only Air Force personnel, but also those civilians who have an interest in issues of aerospace power. Articles may 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. This *Journal* is therefore dedicated to the expression of mature professional thought on the art and science of air warfare and is central to the intellectual health of the Air Force. It serves as a vehicle for the continuing education and professional development of all ranks and personnel in the Air Force as well as members from other environments, employees of government agencies and academia concerned with Air Force affairs. ■

EDITORIAL STAFF

Editor-in-Chief: Colonel Michael Dabros, CD

Senior Editor: Major William March, CD, MA

EDITORIAL BOARD

Colonel William Lewis, OMM, CD, M Eng, M Ed, MBA, MDS, PhD – Strategic Joint Staff

Colonel Randall Wakelam, CD, PhD – Canadian Forces College

Major Paul Johnston, CD, MA – Canadian Forces Aerospace Warfare Centre

Major Raymond Stouffer, CD, PhD – Royal Military College

Doctor Allan English, CD, PhD – Queen's University

Doctor James Fergusson, PhD – University of Manitoba

Doctor Stephen Harris, CD, PhD – Directorate of History and Heritage

Published by Canadian Forces Aerospace Warfare Centre

ISSN 1916-7032

ASSISTANT EDITORS

Adri Boodoosingh, Lisa Moulton and Françoise Romard

GRAPHIC DESIGN

Denis Langlois and Luc Leroy

ONLINE EDITION ANIMATION

Hope Smith

http://www.airforce.forces.gc.ca/cfawc/eLibrary/Journal/Current_Issue_e.asp

http://trenton.mil.ca/lodger/cfawc/eLibrary/Journal/Current_Issue_e.asp

PRODUCTION MANAGER

Anne Pennington

For copies of this publication or to be placed on a distribution list contact Anne Pennington at

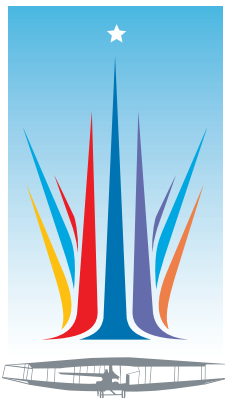
Anne.Pennington@forces.gc.ca

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

CANADA



100

1909 - 2009

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 <i>Journal</i> .
Articles	3000-5000	Written in academic style.
Book Reviews	500-1000	Written in academic style and must include: <ul style="list-style-type: none">• 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 <i>Journal</i> 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 (i.e., not imbedded in the text). Original vector files are preferred; high resolution (not less than 300 dpi) .psd or .jpg files may be submitted.
- Copyright permissions are required for all material that is not Department of National Defence or author originated. It is the author's responsibility to obtain and submit the necessary written permissions which must include the author's/artist's name as well as the publisher's name and location. Any material not meeting these requirements may be omitted from the article.
- The Senior Editor may select images or have graphics created to accompany submissions.
- 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:
 - If they are required in the text, the term is to be written out in full the first time it is used and then followed by the abbreviated form in brackets.
 - If they are required in tables or figures, each table and figure will contain a list of abbreviations.
 - 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.

FOR FURTHER INFORMATION OR TO MAKE A SUBMISSION PLEASE CONTACT THE SENIOR EDITOR AT:

Canadian Forces Aerospace Warfare Centre
8 Wing Trenton
Box 1000 Stn Forces
Astra, Ontario K0K 3W0
Attn: Major William March

William.March@forces.gc.ca

CALL FOR SUBMISSIONS
For the Winter 2010 issue of
The Canadian Air Force Journal
Deadline: 30 October 2009

DISCLAIMER

Opinions expressed in the *Journal* remain those of the author and do not represent Departmental or Canadian Forces policy. Doctrine, training and other material published in the *Journal* does not represent authority for action on that particular topic. All published material remains copyright of the Department of National Defence and may not be used without written permission.

IN THIS ISSUE

SUMMER 2009 • VOL.2, NO.3

- 4 EDITOR'S MESSAGE
- 5 LETTERS TO THE EDITOR
- 6 SUBMISSIONS - PEER REVIEW

ARTICLES

8 GLOBAL MOVEMENTS AND OPERATIONAL SUPPORT HUB CONCEPT:

Global Reach for the Canadian Forces

By Lieutenant Colonel Roy C. Bacot (USAF)

18 *GÖTTERDÄMMERUNG*: THE TWILIGHT OF THE *EXPERTEN*

The Historical Validity of *Luftwaffe Aces'* Success in the Second World War

By Colin Gilmour

32 THE ROLE OF AIR POWER

Air Commodore K.L.B. Hodson, OBE, DFC, CD To The Canadian Army Staff College (reprint)

Kingston, Ontario, 18 April 1955

38 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

By Aaron P. Jackson

BOOK REVIEWS

47 AIR POWER: The Men, Machines, and Ideas that Revolutionized War, From Kitty Hawk to Iraq

By Major Andrew B. Godefroy, CD, PhD

48 ROBERTS RIDGE: A Story of Courage and Sacrifice on Takur Ghar Mountain, Afghanistan

By Major William March, CD, MA

50 FALLING OFF THE EDGE: Travels Through the Dark Heart of Globalization

By Captain François Dufault, CD

Photo: Cpl Rick Ayer

Snowbirds
Photo: MCpl Robert Bottrill

EDITOR'S MESSAGE

In this issue of the *Journal* we have an excellent example of the wide-ranging scope of our contributors. There are articles and reviews from serving/past Air Force members, army officers from Canada and Australia and a student from a Canadian university. Certainly, this is an indication of the breadth of interest in aerospace issues that exists, and it is always desirable to obtain input from as many sources as possible as we continue to refine our understanding of aerospace power. Happy reading!

As well, I would also like to bring to our readers' attention to the *Journal's* policy with respect to the "peer review" of articles. We encourage/welcome submissions from a wide variety of contributors, and all of the submissions are carefully reviewed. However, to encourage contributions from national/international academia, select articles will be subject to a peer review. When these articles are published, they will be identified by a 🌟 to the left of the title or at the beginning of the text of the article. Not only will this process contribute to maintaining the high standard of submissions, it should also help to generate additional interest in the publication. More detailed information on the peer review process can be found on page 6 of this issue and on the *Journal's* website.



Major William March, CD, MA
Senior Editor

LETTERS TO THE EDITOR



Dear Editor:

The article, "Reflections and Questions on Ethics," written by Major-General Terreau (Retired) in the Spring 2009 (Vol. 2, No. 2) issue of *The Air Force Journal* was both interesting and enlightening and probably should be required reading as a part of the curriculum of all Canadian Forces leadership courses, at all rank levels. I would like to add a footnote to the points that he made regarding Canada's Defence Ethics program and, more specifically, the ethical principles that military members are bound to observe.

The three ethical principles laid down in the Statement of Defence Ethics, which applies to individuals as well as to the organization, are: respect the dignity of all persons; serve Canada before self; and obey and support lawful authority. But these have a distinct hierarchy and their positioning is not accidental. While other standards of ethical conduct in the Statement may have almost equal weighting, the principle of respecting the dignity of all persons reflects our universal obligation to humanity, and so it is placed first and uppermost.

The importance of the hierarchy of these principles cannot be overemphasized because, in my opinion, most, if not all, of our other ethical obligations may be derived from this first principle. In a military environment, it applies whether you are commanding a platoon, controlling protestors, making a policy decision that will affect dozens or hundreds of personnel, guarding a prisoner or giving direction to a junior member in an orderly room. Regardless of our other responsibilities to society and to authority, people always come first. It is more than just a platitude. It is an essential principle to live by when you are in doubt about the right thing to do, or doing the right thing.

Sincerely,
Major Richard E. Gower, CD (Retired)

Dear Editor:

I am writing to offer my somewhat belated best wishes to *The Canadian Air Force Journal*, of whose existence I became aware only this week. Having been associated with the *Staff College Journal* many years ago, I am delighted to see a renewed recognition of the need for a publication with a military editorial focus that encourages professional discourse. In an era where military analysts and think tanks proliferate, the *Journal* is a necessary reminder that the officer cannot delegate to others the study of violence.

Jim Jackson

Bill:

For good—and perhaps not so good—reasons, I read our *Air Force Journal* only when travelling on temporary duty. Too busy when at work and too many other "things" to do when at home, they simply take their toll in terms of time available to devote to reading.

Just a quick note to thank you for producing such a top-quality journal that is filled with highly interesting and valuable articles. I raise my hat. Bravo Zulu.


Jeep sends from Berlin.
Lieutenant-Colonel "Jeep" Pichette

Letters to the editor are welcomed and must include the author's name, rank and position. Include a phone number for verification. We reserve the right to edit while preserving the main objective of the writer. We cannot guarantee that any particular letter will be printed. Mail, e-mail or fax to the Journal's Senior Editor.

For further information please contact the Senior Editor at: William.March@forces.gc.ca

SUBMISSIONS - PEER REVIEW

The *Canadian Air Force Journal* (CAFJ) encourages/welcomes submissions from a wide variety of contributors, and all submissions are carefully reviewed. However, to maintain the highest standards and to encourage submissions, based on original research, from national/international academia, the CAFJ has in place a peer review process for select articles.

Articles selected for peer review will be submitted to a minimum of two peer reviewers, who are selected on the basis of their academic qualifications, reputation in the specific field of the paper and overall suitability. Both the author and the reviewers will remain anonymous to each other. Once the reviewer's comments have been dealt with to the satisfaction of the Senior Editor, the published article will be identified in the *Journal* by a  to the left of the article's title or at the beginning of the text of the article.

This policy will be applied at the discretion of the Senior Editor and will be based on various criteria including, but not limited to, the time-sensitivity of the article, the wishes of the author and/or whether the content is suitable for peer review. The goal of the peer review process is to maintain *Journal* standards, encourage original aerospace power research and establish the CAFJ as a publication of choice for scholars in and out of uniform.



Major William March, CD, MA
Senior Editor



Kiwi troops stranded on Crete rig up a sail from blankets and make their way to Egypt

National Archives of New Zealand

The University of Calgary is Host to an International Academic Conference Organized by the University of Calgary Centre for Military and Strategic Studies, the Department of History, and the History Graduate Students' Union.

Seventy Years On: New Perspectives on the Second World War

Keynote Address, Commemoration of the outbreak of the war, and Reception,
Calgary Military Museums, August 31, 2009, 4:00-9:30 p.m. Free for Veterans.

International Academic Conference, Lake Louise, Banff National Park, Alberta, Canada
September 1-September 2, 2009.

WWW.UCALGARY.CA/NEWPERSPECTIVES

Sponsored by the United States Institute for Policy Research, the Network for North American Studies in Canada,
the Society for Military History, and Mount Royal College.

Organizing Committee: David Bercuson, Holger Herwig, John Ferris, Alexander Hill, Abraham Roof, and Christine Leppard.



**GLOBAL
MOVEMENTS AND
OPERATIONAL
SUPPORT HUB
CONCEPT:
GLOBAL REACH FOR
THE CANADIAN FORCES**

By Lieutenant Colonel Roy C. Bacot (USAF)

Introduction

In August 2006, Colonel Mike Boomer (Chief Operational Support Transformation for Canadian Operational Support Command [CANOSCOM]) wrote a discussion paper for the Commander CANOSCOM which laid the foundation for the operational support hub concept and argued the need for it within the Canadian Forces (CF). As I trace the history of this concept, I'd be remiss if I didn't mention that much of his work is included in this article and continues to serve as the catalyst behind our concept/project.

If you believe that in the future Canada will want to actively deploy and employ forces off-continent in pursuit of its national interests, then you share the same viewpoint as our Operational Support Transformation team here in CANOSCOM. Released in May 2008, the *Canada First Defence Strategy*¹ lists six core missions for the CF both in Canada and abroad. Two of those six core missions are (1) to lead and/or conduct a major international operation for an extended period and (2) to deploy forces in response to crises elsewhere in the world for shorter periods.² Our operational support hub concept is envisaged to enable the CF's global reach when conducting such missions. The decision to acquire four CC177s for strategic airlift and three Joint Support Ships for strategic projection by sea would seem to confirm the government's intention to extensively utilize the CF off-continent. Given this evidence, the issue for the CF is how to maximize the force projection capabilities that these new platforms will provide. This article will show how the introduction of an operational hub and spoke

system for support, movements and distribution will enable the CF to most efficiently deploy forces into the various regions of the world that the government is most likely to ask us to operate.

Background – The Effect of Geography, History and National Interests

One of the biggest challenges facing the Canadian Forces is to deploy its units and formations off-continent and then to sustain them. For Canada, the nature of this challenge is a product of a combination of its geography, history and national interests. The combination of these three factors is quite different for Canada in comparison with other countries; consequently, Canada's force deployment and employment plans must be tailored for its unique situation. By way of comparison, most European countries design and maintain their forces primarily for on-continent use. During the cold war, arguably one of the greatest historical influences on modern military forces, European nations prepared to fight a war on home turf against the Warsaw Pact. Canada prepared its military to counter Soviet aggression in North America in cooperation with the United States by forming the North American Aerospace Defense Command and in Europe through forward basing of CF formations in Germany under the North Atlantic Treaty Organization (NATO). The exceptions to this general rule were usually those countries that had colonial legacies, as these placed an onus on the countries to support off-continent contingencies in support of their former colonies.

Photo: Sgt Roxanne Clowe

Canada prepared itself to fight in the Atlantic and Europe as well; for Canada this meant building a forward-based force designed to fight off its home continent on external lines of communication (LOC). Canada's constant engagement in various United Nations (UN) missions around the world reinforced the requirement to prepare for off-continent expeditionary operations.

This situation presents Canada with challenges that are not commonly found among our allies and dictates a strategic view that is somewhat different than most. For those countries with colonial or post-colonial ties, the colony or former colony presents itself as the natural base for operations in the region. For the United States, its wealth, power, prestige and huge military provides it with opportunities that are not afforded to Canada with its much more modest resources. Australia is in a situation similar to Canada's, except that in the past it has concentrated on becoming a regional power, while Canada's interests have been more global.

For most countries, however, the shift in geopolitical imperatives resulting from post-cold war conflict requires a fairly dramatic and fresh approach to future contingencies. The nature, size and competencies of their military forces must be closely examined and reshaped to meet future threats. Canada is certainly among those nations needing to do so, and in the past three years, CF Transformation activities have made significant progress in attaining capabilities required for the future.

Operational Support Hubs – Why? Where?

Understanding CF Support Requires Forecasting CF Employment

If, militarily, Canada were to retire onto the North American continent and make the political decision to restrict the use of the CF to continental requirements, there would only be a limited need to project international support. For example, if such an imaginary

restricted area of operations was Canada, the United States and Mexico, then the CF could concentrate on ensuring that facilities for reception, staging and onward movement (RSOM) were available via bi- or tri-lateral arrangements. The CF could create a highly focused sustainment system, probably based on trains and trucks supplemented by aircraft and some shipping to ensure the timely flow of materiel. In short, the distribution system of this imaginary operational area would look remarkably like the current NATO system, as viewed by a European nation.

Given that Canada's interests are not so narrowly focused, however, some other system for deployment, RSOM and sustainment is required. While Canada can avail itself of the many facilities and agreements currently available under the NATO aegis, these are usually limited to the contiguous NATO landmass and only occasionally extend extra-territorially. The challenge then becomes to find some alternative manner to effectively and efficiently (read cheaply) support the CF during deployment, RSOM and sustainment when operating off-continent and outside of the NATO area.

Creating the optimal system for deployment, RSOM and sustainment of CF units and formations would require complete knowledge of where the CF will operate over the coming years and what the nature of those operations will be. Fortunately, no one is currently afflicted with this curse; in place of omniscience we must apply professional judgement.

Failed and Failing States

In the CF's *Future Security Environment 2025* prepared by the Directorate of Operational Research, Mr. Peter Johnston and Dr. Michael Roi assess that while interstate warfare between major powers is possible, near-term future conflict will probably be intrastate and occur in the developing world. They note, “[i]ncreasingly, the focus of strategic planners should gravitate towards meeting the challenges of failing states and the civil wars they often trigger.”³

Various individuals, groups and organizations have attempted to quantify what

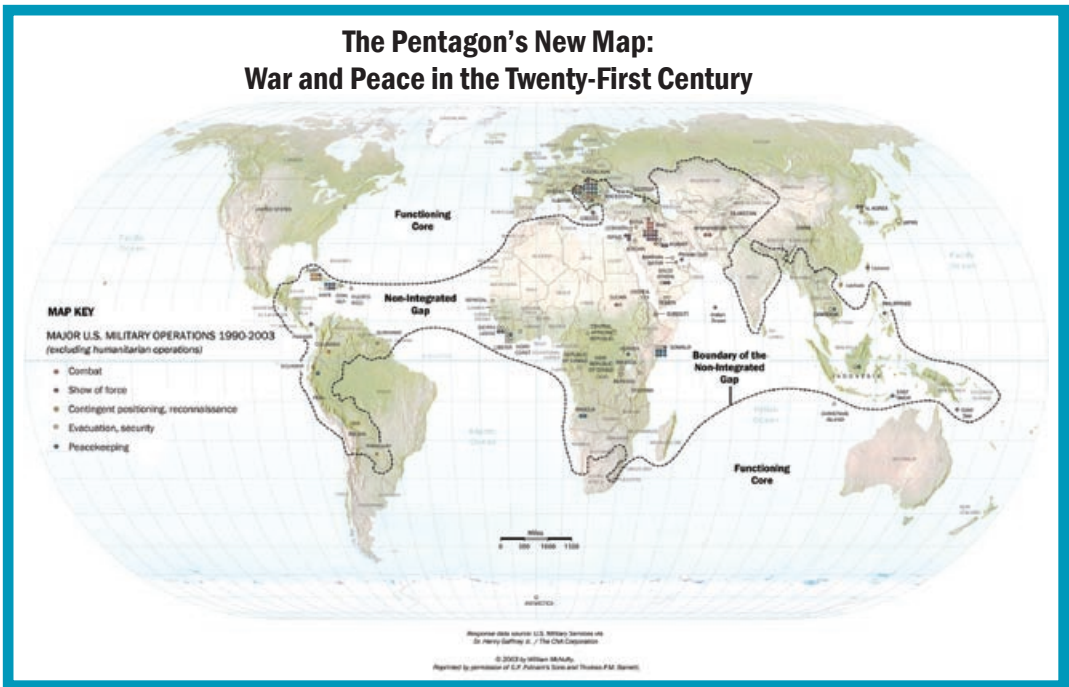


Figure 1: The Non-integrating Gap

constitutes a failed or failing state. In his book *The Pentagon's New Map: War and Peace in the Twenty-first Century* and as shown in Figure 1⁴, Thomas Barnett identified a region that he referred to as “the Non-Integrating Gap.” Barnett’s analysis is that a significant part of the world has been disconnected from the global economy and consequently from the benefits (and strictures) of globalization. He also identifies the zone of functioning states. These states are part of the global economy in that they share and increase wealth through trade and the introduction of common legal, political and economic policies (that in turn permit the freer flow of wealth in the economy thus continuing the increase in wealth). Barnett sees the threat to the United States coming from those countries that are not part of the “functioning core” of the globalization. He believes that these nations are likely to descend into a chaos that supports terrorism or can provide a base for those that do. Consequently, they become the “expeditionary theatre for the U.S. military in the twenty-first century.”⁵

Foreign Policy magazine has its own map of failed and failing states; it is derived from a

theorem that the propensity towards conflict is a function of a variety of measurable economic and social factors that can provide an index figure for each country.⁶ The Foreign Policy Research Organization has completed this calculation for most of the world’s countries and determined which are most likely to fall into conflict (see Figure 2)⁷. According to Foreign Policy, failed states can be identified by armed conflict, famine, disease outbreaks and refugee flows within their borders. In the past, these events have been sufficient reason for Canada to deploy forces, and it is reasonable to assume that the same will be true in the future.

Humanitarian Aid

Missions arising from the consequences of failed and failing states are not the only CF missions for the future. The deployment of CF elements in support of humanitarian aid can be to any place, at any time. The most surprising deployment of the last 30 years is arguably the support to New Orleans, Louisiana in 2005. The fact that Canada would send troops to the United States suggests that there is no part of the world that is immune to disasters.

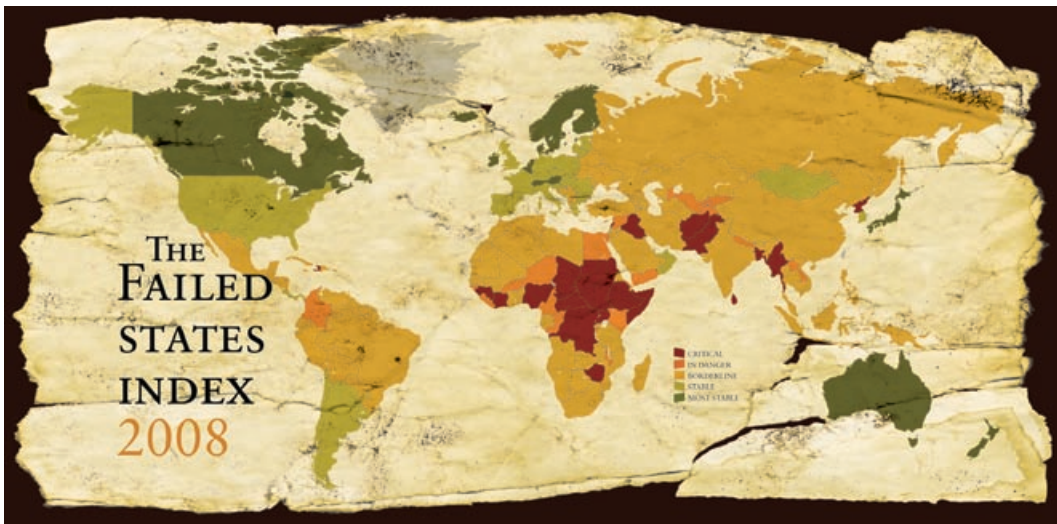


Figure 2: The 2008 Failed State Index

Consequently, the CF must be ready to respond to humanitarian aid crises perpetrated by fire, flood, famine and pestilence anywhere in the world. While such events can occur in virtually any country at any time, those countries that have the least capacity to render aid to their own citizens are the ones most likely to require the most assistance and can therefore be assumed to be the more likely destinations for CF deployments. Consequently, the Failed States Index may also be considered to have some relationship with even humanitarian missions, although that relationship may not be as compelling as it is for intervention operations.

Characteristics of Operational Support Hubs

An ideal operational support hub would assist in the deployment of CF forces, their RSOM, sustainment and finally, redeployment. The hub would always be available, be able to expand to support the mission or missions in the vicinity and cost little to maintain. The following general characteristics must be considered when selecting a hub:

Geography. The hub would be close to the mission areas so that the cost and time for the move between the hub and deployment areas is minimized.

Commercial LOCs. The hub would already be a regional hub for commercial distribution and movements; it would connect major off-continent air and seaports to the regional sea, air and land routes. Similarly, the hub would have good commercial connections into the regional public telephone and telegraph infrastructure, thereby permitting maximum use of these existing facilities to support the CF's communications needs in this region.

Climate. The hub would be climatically similar to the deployment areas so that arriving troops could adapt before moving into these areas.

Commercial Facilities. The hub would possess commercial and/or military vehicle and equipment repair facilities that could be used to maintain CF materiel in theatre. The hub would also possess good hotel and entertainment venues to allow the troops to take short rest and relaxation trips out of the deployment areas.

Political. The hub would be in a country whose population and government were favourably disposed to Canada and members of the CF. Municipal and federal government officials should be relatively free of corruption; police and customs services should be efficient and operate under a rule of law.

The country should be stable enough so that it is unlikely to be severely affected by the regional problems that cause the deployment of CF assets.

These characteristics can be further defined according to the stage of a deployment:

Pre-deployment. In addition, the hub should be sufficiently close and integrated into the regional affairs so that the hub detachment can serve as the CF's eyes and ears. The detachment, by being in location, should be able to unofficially advise National Defence Headquarters (NDHQ) and the commands on events as seen in the region. Furthermore, the detachment should be able to effectively assess the CF's needs and determine how, should it be required, the CF could effectively deploy into the area. In addition, the detachment should be capable of maintaining an inventory of facilities that could be used to support CF activities and have in place standing offers and contracts with key suppliers, repair facilities and hotels to permit, if required, the hub's rapid enlargement. During the reconnaissance phase of any regional deployment, the hub detachment could handle the administration for the reconnaissance team and provide an up-to-date situation briefing, as well as introductions into the municipal political and commercial sector. These activities would have to complement, and not compete with, the efforts of the Canadian ambassadorial and the defence attachés for the region. While this should be manageable, there will probably be some difficulties.

Deployment. Once NDHQ and Canadian Expeditionary Force Command (CEFCOM)—in conjunction with CANOSCOM—have determined the deployment details, the hub would likely have to be expanded during the deployment phase. Using members of CANOSCOM's Joint Signals Regiment (JSR), Joint Support Group (JSG) and Canadian Materiel Support Group (CMSG), the hub would expand only as much as required to handle the influx of personnel and materiel moving from North America and into the deployment area. The extent of such efforts would be tailored to each mission. Where the

RSOM plan included in-theatre acclimatization or additional training, the hub detachment could facilitate these activities. In addition, because of the intimate relationship between the CANOSCOM units and formations, the hub detachment could assist JSG's and JSR's theatre opening activities by providing knowledgeable personnel or facilities. Should another temporary support hub be required to facilitate the movement into theatre (i.e., a seaport closer to the deployment area could be used to discharge equipment and materiel for a road move into the mission area) then the hub could be used as a jumping off point and support the temporary support hub. Depending on the nature of the mission, temporary support hubs could be opened and maintained for only the deployment phase of the mission (and, if necessary, reopened for the redeployment phase) or kept open throughout the mission.

Sustainment. Based on the operational research conclusions that 80 percent of the lift costs to support a mission occur during the sustainment phase, this is the time when the operational support hubs should be able to pay for themselves—by avoiding unnecessary lift costs. This would be accomplished by: consolidating loads in order to reduce unused cargo capacity; providing a break point for strategic sea movements; procuring some materiel locally to avoid immediate operational requirement (IOR) air shipments from Canada; and avoiding backhaul costs to Canada for materiel that can be repaired at the hub. In addition to new, large missions, these hubs could extend support to the many small CF detachments that serve with various UN mission headquarters and provide these members with a local support sustainment network that is not currently available to them. In addition, the operational support hubs would provide support to naval operations in the region, particularly food, fuel and repair facilities.

Redeployment and Reconstitution. As with the deployment phase, both permanent and temporary operational support hubs would be used to support the drawdown and teardown of a mission. Depending on the mission size, complexity and location, the operational

support hub detachment could conceivably complete the teardown activities, thus releasing troops back to their units sooner and, therefore, avoiding the costs of keeping them deployed. The availability of commercial contracts and a Status of Forces Agreement in the hub country would certainly reduce the overall costs and difficulty of this activity for many missions.

The potential for improving the reliability and timeliness of sustainment to deployed forces, possibly at a reduced cost, should be a key factor in considering a network of operational support hubs. Currently, a sustainment system is custom built from scratch for each CF mission. As a consequence of the closure of the CF's European bases and the focus on deployments from Canada rather than offshore, a separate distribution network is set-up each time a new mission deploys. The result of this has been a heavy reliance on airlift and, in particular, chartered airlift supplemented by the airlift capabilities of the CC150 "combis" to support deployed missions. In each case, the deployment systems have been built to accommodate only that mission, for a limited time and with the intention of closing the route at the end of the mission. Ad hoc arrangements of this type make it difficult to employ a more cost-efficient, intermodal transportation system that can still meet operational timelines. Consequently, there has been little investment in sealift options due to timeliness delivery issues or in creating offshore storage facilities.

Development of Operational Support Hubs

By themselves, operational support hubs should improve the CF's ability to deploy and sustain missions; however, by also making this a whole of government activity, the CF could assist in other initiatives. In particular, operational support hubs could assist the Canadian International Development Agency in moving and distributing materiel as well as providing voice and data communications in the regions. Properly located hubs could facilitate the movement of people, materiel and information into these countries.

In addition, to maximize the utility of these operational support hubs, the CF should also invest in a number of related areas:

Understanding the Region. Some CF officers and non-commissioned members (NCMs) should be selected for enhanced training and education in the regions. In particular, young support officers and junior NCMs should be screened to select those with the interest and aptitude to become subject matter experts in the language, political, economic, religious and cultural aspects of the regions serviced by individual operational support hubs. These members would be given out of service training to improve their understanding of the regions and would be employed in related areas, including commanding the operational support hub detachments.

Building Relationships. Where possible, members of the armed forces of the countries in which the operational support hubs were established would be invited to attend Canadian professional military courses, including Staff College and support schools training courses, so that CF members could build personal relationships with what should later become the senior members of their respective armed forces. Small unit exchanges would permit CF and host country militaries the opportunity to share relevant knowledge, experience, tactics, techniques and procedures.

The Initial List

The results of the foregoing work, along with a related analytical study⁸ by Dr. Ahmed Ghanmi of the CANOSCOM Operational Research and Analysis Cell, have suggested that Canada should consider creating operational support hubs in the following regions:

**central/south America;
Europe;
west Africa;
east Africa;
east Asia;
south-west Asia; and
south-east Asia.**

Each of these locations is indicative as opposed to absolute. As shown in Figure 3, an operational support hub in each of these regions creates a series of hubs with overlapping areas of influence. The radius of each circle is approximately 2,000 miles; this distance is the approximate range of a tactical airlifter such as the C130J or A400M. As Figure 3 also shows, this group of hubs provides coverage of most of those countries at greatest risk, using either Barnett's theory of Non-Integrating States or *Foreign Policy's* Failed States Index. Some adjustment to the specific locations could easily be made, but the aim should be to ensure a more or less consistent coverage of the areas enclosed in the Figure 3's circles.

Day-to-Day Running of the Operational Support Hubs

The Canadian Materiel Support Group was specifically created to manage the operational level national and international warehousing and distribution system. The CMSG has under command the two national supply depots and the four national ammunition depots. It is also responsible for creating and maintaining the lines of communication among the force

generation and force employment formations in and outside of Canada. As such, it has the knowledge on how to run distribution nodes, as well as the technical expertise and responsibility to do so. Perhaps more importantly, it also has sufficient personnel to provide oversight and replacements to these small detachments. This latter factor will be especially important, since small detachments will often require a replacement from some central pool of experienced personnel to cover sickness, professional courses, leave and other events. By placing the operational support hubs in CMSG's order of battle, they will receive the appropriate leadership and technical guidance.

When a large deployment exceeds the capacity of the CMSG to expand, an operational support hub, the JSG and/or JSR can add the weight of their experienced personnel to quickly expand the hub to whatever size is required. This will most likely occur during a deployment or redeployment phase, but could include some of the sustainment phase as well. Because the CMSG, JSG and JSR are all part of CANOSCOM, their contributions can be managed by CANOSCOM's operations centre with direct taskings to the CMSG, JSG and

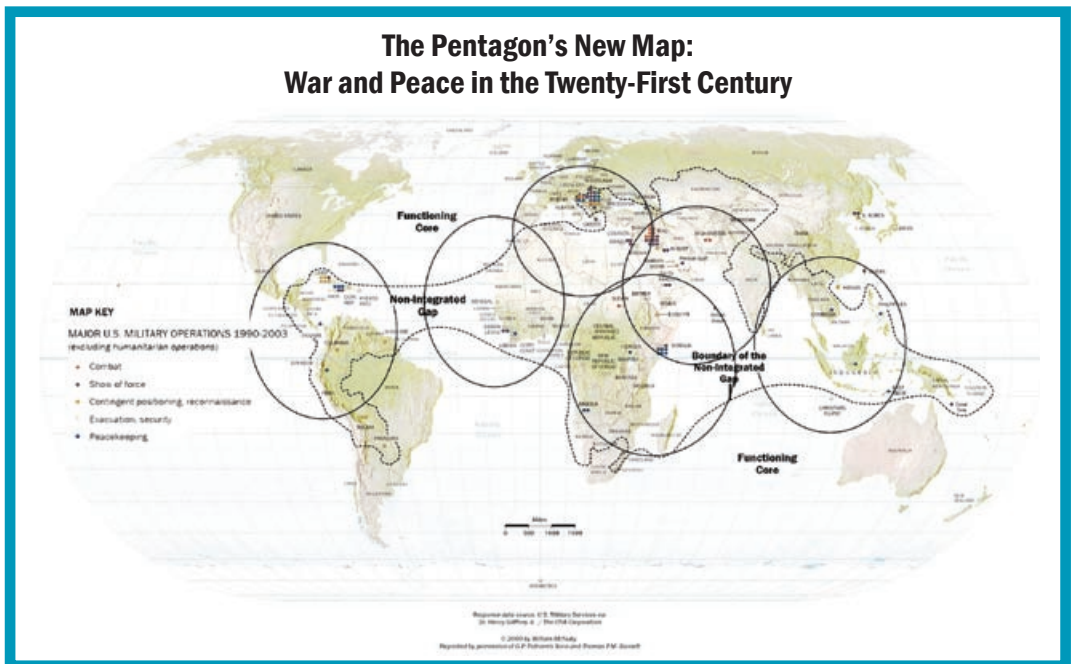


Figure 3: Proposed Operational Support Hub Locations

JSR operations centres as required. This provides a simple, clean and easily understood command and control chain for the daily running of the hubs. New requirements for the hubs from other government departments (OGDs), Canada Command, CEFCOM or CANSOFCOM can be identified to CANOSCOM's operations centre which in turn can assign tasks and resources as appropriate.

Proposed Way Forward

The viability of operational support hubs has already been tested over the past 15 years in an ad hoc fashion. The CF has regularly used them since deploying to the Gulf in the First Gulf War, but each only for a limited period of time. The consequence has been a continual cycle of investment, education, use and abandonment. To break this cycle and consider global reach as an essential element of CF operational doctrine, the first step is to accept the concept of permanent operational support hubs. For this, Commander CANOSCOM has initiated a proof of concept in Germany, the EuroHub, and, in response to a Chief of Defence Staff Initiating Directive, a proposed project for the remaining global hubs network. Approval has been granted for the European hub and on April 20, 2009 the official ceremony opened the European hub. Once DND approval is obtained to open the remaining hubs, the project can put in place the necessary arrangements and then turn the running of the remaining operational support hubs over to

CMSG. The project should close once the full slate of authorized operational support hubs is open and running. To validate the expected cost avoidance opportunities, a performance measurement system should be put in place to measure (or attempt to approximate) the number of personnel and the value of materiel moving through each hub. This information should subsequently be used to guide the continued development of the concept.

Summary

This article proposes that Canada invest in a series of operational support hubs located in selected countries that are close to the most likely regions for future CF operations. These hubs would be tied together by air and sea lines of communication, using commercial, CF and allied military assets and would serve not only the CF's needs, but also those of other government departments. At each hub, a small detachment would establish itself in the region of the airport or seaport with a small leased warehouse, some materiel handling aids and an office. The detachment would be part of the CMSG but work closely with the military attaché for the region and the head of mission for the host country. The detachment would establish contracts with various host nation chandlers and suppliers to provide support as and when required for CF elements or OGDs operating in the region. If a major operation takes place in the region, then the CMSG,



*Signing ceremony: Left to Right
 LCol D.P. Boyle, new Spangdahlem Detachment Commanding Officer
 MGen D.J.R.S. Benjamin, Commander CANOSCOM
 Capt (N) A.L. Siew, Commander CMSG*

JSG and/or other specialists would, as required, reinforce the detachment. Some materiel could be pre-positioned at these warehouses, but this should be the exception.

From the outset, the selection of the hubs should involve not just the CF but should also include Foreign Affairs advisors so that the hubs are established with a whole of government flavour. In addition, not all hubs need be established at once, but they can be added as government attention focuses on a particular region.

Creating a series of hubs represents a low-risk and a potential high-return option for increasing Canada’s global reach. When coupled with the CF’s intended purchases for strategic airlift and sealift, establishing operational level rest, repair and transit hubs will provide the foundation for optimizing the movement of both cargo and personnel into and out of future theatres of operations. In short, operational support hubs will permit the CF to project and sustain itself globally—exactly what the *Future Security Environment* analysis suggests we do. ■

Lieutenant Colonel Roy C. Bacot, a United States Air Force C-17A Instructor Pilot assigned to United States Transportation Command (USTRANSCOM), is serving as an exchange officer with Canadian Operational Support Command (CANOSCOM). He is the lead officer within the Analysis and Design Branch, which concentrates on operational support transformation for the Canadian Forces. Lt Col Bacot is the first USAF officer to fulfill this critical international line of communication (ILOC) position within the Canadian Forces.

List of Abbreviations

CANOSCOM	Canadian Operational Support Command	NATO	North Atlantic Treaty Organization
CEFCOM	Canadian Expeditionary Force Command	NCM	non-commissioned members
CF	Canadian Forces	NDHQ	National Defence Headquarters
CMSG	Canadian Materiel Support Group	OGD	other government departments
JSG	Joint Support Group	RSOM	reception, staging and onward movement
JSR	Joint Signals Regiment	UN	United Nations
LOC	lines of communications	USAF	United States Air Force

Notes

1. Available online at <http://www.forces.gc.ca/site/focus/first-premier/index-eng.asp> (accessed May 14, 2009).
2. Canada, Department of National Defence, “Canada First Defence Strategy – Six Core Missions,” Department of National Defence, <http://www.forces.gc.ca/site/focus/first-premier/missions-eng.asp> (accessed May 13, 2009).
3. Peter Johnston and Dr. Michael Roi, *Future Security Environment 2025* (Ottawa: Department of National Defence, Operational Research Division, September 2003). Available on the DIN at http://vcds.mil.ca/dgsp/pubs/rep-pub/ord/fse2025/intro_e.asp (accessed March 30, 2009) and the internet at <http://cradpdf.drdc.gc.ca/PDFS/unc35/p520084.pdf> (accessed May 13, 2009).
4. Reproduced with permission from Dr. Thomas P. M. Barnett’s book *Pentagon’s New Map* www.thomaspmbarnet.com. © Copyright 2002.
5. Thomas P. M. Barnett, *The Pentagon’s New Map: War and Peace in the Twenty-First Century* (New York: G. P. Putnam’s Sons, 2004), 134.
6. The Foreign Policy Research Organization information is available online at http://www.foreignpolicy.com/story/cms.php?story_id=4350 (accessed May 13, 2009).
7. Reproduced with permission from *FOREIGN POLICY* #167 (July/August 2008) www.foreignpolicy.com. © Copyright 2008 by the Fund for Peace and Washingtonpost.Newsweek Interactive, LLC.
8. Dr. Ahmed Ghanmi, *Modeling and Analysis of Canadian Forces Operational Support Hubs*, DRDC CORA TM 2008-020, June 2008.
9. Reproduced with permission from Dr. Thomas P. M. Barnett’s book *Pentagon’s New Map* www.thomaspmbarnet.com. © Copyright 2002. Note: Circles have been added to indicate the regions where operational support hubs should be considered.

GÖTTERDÄMMERUNG:

**THE TWILIGHT
OF THE EXPERTEN
THE HISTORICAL
VALIDITY OF**

LUFTWAFFE

**ACES'
SUCCESS**

**IN THE
SECOND WORLD**

WAR



BY COLIN GILMOUR

Götterdämmerung was the last of Richard Wagner's four part opera *Der Ring des Nibelungen*; it is translated from ancient Norse as "Twilight of the Gods." In Norse myth *Götterdämmerung* marked the doom of the Gods.¹

The Second World War likewise spelled the doom of many things, one of the most notable being the era of the propeller driven fighter planes and the men who flew them: the romantic fighter aces. The term "ace" has become synonymous with excellence, skill and superiority. The term, first used by the French *Armée de l'Air* in the First World War, denotes a pilot who has destroyed five enemy aircraft. This term became widespread amongst air forces and continued with one exception into the Second World War. In the *Luftwaffe* (the Second World War German Air Force), one needed 10 kills to be considered among the *Experten* (experts).² The *Luftwaffe* aces are by far the most successful combat fighter pilots in history, their kill totals number in the thousands. Over 100 Second World War German pilots could boast of 100 kills or more, while the Allied Air Forces could together not boast of a single such ace. Consequently, their exploits have come under scrutiny since 1945, and many have questioned or outright dismissed their extraordinary aerial kill totals. American Lieutenant General E. R. Quesada once declared, "I do not believe...that any German ace shot down one hundred and fifty Allied planes," and British Wing Commander Asher Lee asserted that *Experten's* "mammoth claims...sometimes over the two hundred mark, were absurdly exaggerated."³ It is the contention of this work that such distrust is groundless and robs these gallant warriors of their just historical due. This paper will prove that the *Luftwaffe Experten's* success is not only historically accurate but was inevitable due to the circumstances in which they found themselves in the years before and during the Second World War.

The system for scoring in the German *Luftwaffe* was highly inflexible in its designation of kills. Several authors have documented the "thoroughness and rigidity" of the confirmation system used by the *Luftwaffe*.⁴ Specifically, the Germans firmly adhered to a "no witness-no kill" policy for their kills.⁵ Second World War General of Fighters Adolf Galland (104 kills), once included in a report, "I resign the confirmation of this kill for a lack of a witness."⁶ Authors Trevor Constable and Colonel Raymond F. Toliver (Retired) in their book *Horrido* include the fact that the rigidity of this system was maintained in all combat theatres in which the *Luftwaffe* fought.⁷ In combat, *Luftwaffe* pilots called "horrido" over the radio to denote a kill or flaming enemy fighter in order that the other pilots and ground personnel might be on the lookout for its destruction.⁸ This method of scoring could lead one to suspect fraudulence amongst claims. Author and fighter ace biographer Christopher Schores specifically states, however, that according to his 20 years of research there were some who made fraudulent claims, but most were found out and that the majority of German victory claims were well founded and honest, frequently being **more** accurate than those of their opponents.⁹ One example of this contention is discussed by author Len Deighton, who records that during the Battle of Britain the *Luftwaffe* set up an *Abschusskommission* (commission) to investigate pilot claims, which turned out to be far closer to actual British losses than the opposite British claims for *Luftwaffe* planes downed.¹⁰

One famous incident which has been the focal point of skeptics is the fantastic accomplishment of the "Star of Africa," Hans Joachim Marseille, who shot down 17 British aircraft in a single day. Gunther Rall (275 kills), a comrade in arms while working on the staff of Adolf Galland and who had to review German combat reports ad nauseam, stated:

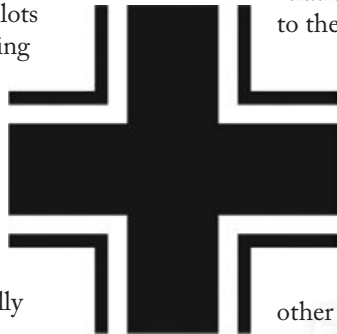
The wartime combat reports of the *Luftwaffe* fighter pilot were highly detailed. Every evening you had this business to go through. Witness, air witness, ground witness, your account of the combat, the type

of enemy aircraft, the kind of ammunition you fired, the armament of your aircraft, and how many rounds of ammunition.¹¹

Rall claims that he calculated Marseille to, on average, expend 15 rounds of ammunition for a kill.¹² Constable and Toliver in *Horrido* provide the eyewitness accounts of Marseille's big day from fellow pilots, specifically Marseille's wingmen. They chronicle and record the event in vivid detail, the facts of which in 1964 were verified by the authors in a study they conducted to prove once and for all the veracity of the story.¹³ Author Edward H. Sims records his interview with ace Erich Rudorffer (222 kills) who likewise chronicles in meticulous detail his eight victories in a single day.¹⁴ Interestingly, Marseille and Rudorffer both had such big days against British pilots in North Africa, not against the inexperienced pilots that they faced during the opening of Operation Barbarossa, the invasion of the USSR.¹⁵ Thus, it can be said that the fantastic accomplishments of pilots like Marseille and Emil Lang (who shot down one more than Marseille in a single day: 18) are historically plausible and accurate based on such events' commonality and proven veracity.

William N. Hess takes time in his book about Second World War airmen to discuss and compare the various belligerents' scoring systems. He notes that "contrary to popular belief the *Luftwaffe* did not award victories on the basis of the number of engines of the downed aircraft"; however, this was used for decorative kill markings on *Luftwaffe* aircraft.¹⁶ Hess mentions the scoring systems of, for example, the British and Americans, who awarded "shared" or "partial" kills for several pilots who had downed the same aircraft; the French Air Force even awarded whole kills for the same aircraft to the multiple airmen who had downed it, one plane being plausibly worth four individual kills. The *Luftwaffe*, however, avoided this, with only a single pilot being

awarded a victory for a downed aircraft.¹⁷ For example, when the renowned night fighter ace Heinz-Wolfgang Schnauer (the top night fighter pilot in history: 121 kills) and fellow airman Wilhelm Herget both claimed the same British Lancaster bomber downed, their commanding officer ordered them to cast lots for the kill; Herget won.¹⁸ At first glance, one might also be misled by the *Luftwaffe* point system of the Western Front which awarded multiple points for a single aircraft downed. This system was invented in order to create uniformity in the awarding of decorations like the coveted *Ritterkreuz* (Knight's Cross) to fighter pilots. The system awarded, for example, one point for a single engine plane and three points for a four engine aircraft. This system was **not** a confirmation system and bears no relation to *Experten's* kill totals, only to the decorations gleaming on their breasts and around their necks.¹⁹



In sum, the *Luftwaffe* system for recording and confirming kills has been thoroughly researched by historians and proves the victory totals of *Experten* as correct and often more realistic and representative than those of other nations.

The means by which the fruit of the *Experten's* labours were calculated leads to the logical issue of how and why they were able to reap such a plentiful harvest. The first aspect of this discussion is chronological, a look into the pre-war society and experiences from which *Luftwaffe* pilots started the Second World War. Interwar Germany was a society which was downcast and in need of hope and a raising of belittled spirits. One of the things which met this need was a nostalgic glimpse of the past glory of the First World War, in particular the "Knights of the Air" like Oswald Boelke and Manfred Von Richthofen. What became obvious to the leaders of the new Germany, in particular to future *Reichsmarschall* Hermann Goering, was that these heroes of old could be used to inspire and create a new generation of German air warriors. Goering once stated: "The young Germany shall be brought up in

a passion for flying in order that the German nation shall become a nation of pilots.”²⁰ As such, he publicly proceeded to “impress on all pilots, the spirit that in four years of heroic life proved so successful and singled out German flying during the war.”²¹ The romantic phenomena that this produced electrified the hearts and minds of Germany’s youth. Numerous of the future *Luftwaffe*’s aces first flew while in their early teens in Germany’s flying clubs or Hitler Youth programs. Examples include Adolf Galland (who was 17 when he first soloed and who described his youth as being filled with the thought of flying) and Erich Hartmann with 352 kills (who was the most successful ace of all time and who was a licensed glider pilot at 14). Other greats such as night fighter pioneers Hajo Hermann and Kurt Buehligen recorded similar experiences in their youth.²² Future *Experten* were behind the controls of aircraft for many years before the first shots of the Second World War were ever fired.

This enthusiasm was harnessed by Nazi Germany’s leaders in creating the *Luftwaffe*. Secretly, Germany created the new Air Force with these energetic young men who were totally occupied with a future in aviation. Hermann Goering, its creator, because of his closeness to Hitler ensured that the service’s needs were fulfilled. The *Luftwaffe* received the best officers from the armed forces and the best that Germany could offer its gallant fliers. A pre-war English visitor to a *Luftwaffe* facility, C. G. Grey, was amazed at the luxury and importance that was given to aviation personnel and mistook the transport drivers’ mess for the officers’ quarters.²³ The training of these young men was both thorough and practical. Grey, cited in Len Deighton’s *Fighter*, also made note of the thoroughness of the *Luftwaffe* pilot training program, which Deighton expands upon by explaining the practicality of German training, as opposed to the contemporary “air show” training of British pilots of the pre-war era.²⁴ Despite this imbalance, the training of German pilots was unique for other reasons as well.

The German state engaged, as is well known, in covert methods in order to ready its nation for war. Specifically, fighter pilots were

secretly sent abroad to gain experience. Some of them, for example, were covertly sent to the Soviet Union for training.²⁵ Most importantly, the *Luftwaffe* sent its pilots to Spain for practical combat experience in the Spanish Civil War, where Adolf Galland in his memoirs recounts that the Second World War “was being rehearsed on a small scale.”²⁶ In Spain, flying much of the time in outclassed biplanes, the Germans experienced combat and developed the tactics and vocational know-how to apply to modern aerial warfare which would give them an undeniable edge over the less experienced pilots and leadership of other nations in the years to come.²⁷ The spirit of aviation which permeated German youth created a body of professional fighter pilots who “provided a cadre of skilled men quite beyond those of any other Air Force.”²⁸ Future *Experten* like Galland, Werner Moelders (115 kills), Hans Trautloft (57 kills) and Walter Oesau (123 kills) had time and the practical experience gained in the combat during the Spanish Civil war to develop the instincts and professionalism of elite fighter pilots. These facts taken in historical comparison and retrospect make legitimate the claims of authors Constable and Toliver, who claim that the *Luftwaffe* fighter force was, without question, the best in the world in 1939.²⁹ In sum, because of pre-war experience it is plain how *Luftwaffe* pilots enjoyed an advantage over their early opponents.

Though the fighter pilots of the *Luftwaffe* had such a pre-war advantage, and this being one justification for their future success, it is truly in the war years themselves when the majority of said validation occurs. This discussion will hereafter involve several facets; first and very significantly is the fact that *Luftwaffe Experten* throughout the war simply had more combat flying experience, which serves to justify an increased level of combat expertise. Although not universally, many of the *Experten* served in combat conditions for the duration of the entire war (such as Galland, Johannes Steinhoff [176 kills], and Gerhard Barkhorn [301 kills and the vice-president of the legendary “300 Club”]).³⁰ Author Williamson Murray, in his work *Strategy of Defeat*, notes that “only

8 of Germany's 107 aces to score more than 100 victories joined their squadrons after mid-1942.³¹ Consequently, the sheer number of missions which were flown by *Luftwaffe* pilots during the war must therefore be accorded as justification for the possibility of such levels of success and vocational skill. Major Erich Rudorffer (222 kills), for example, flew all told over 1,000 combat missions in almost every theatre, and amazingly, Erich Hartmann flew an estimated 1,456 missions in his short career.³² The reason that *Luftwaffe* aces had such experience and flew so often was twofold.

When asked about the discrepancies between Allied and German kill totals, Kurt Buehlig (112 kills) cited the fact that unlike Allied Air Forces, specifically the Royal Air Force and Americans, the *Luftwaffe* did not rotate their pilots from combat flying.³³ There were no "tours" for the *Experten*. In Williamson Murray's words: "For the German pilot, there was no magic number of sorties or hours, the completion of which guaranteed a return home," rather, the *Luftwaffe* pilot "was already home."³⁴ William N. Hess agrees, stating that "it must be remembered that most *Luftwaffe* pilots flew under intensive combat conditions from the first day of assignment to a fighter unit until they fell—or, in more than few cases, until the war ended."³⁵

The second reason for the amplified combat flying of German pilots was simply that their nation had no alternative but to keep sending them into the sky. Arguably, since the attrition of the Battle of Britain and the early successes in the Soviet Union, the *Luftwaffe* had been fighting a strategically defensive war. The various campaigns which followed exemplify this notion, most notably the Eastern Front, where pilots had to fight against swarms of Soviet aircraft and in the West against the Allied bomber streams. Germany could not afford to relieve the *Experten* due to the attrition rates which the German fighter arm suffered.³⁶ Goering at one point declared that pilots had to refuel at least three times before being allowed to quit a battle.³⁷ Johannes Steinhoff in his book *The Straits of Messina* recalls a heated

argument he had with Adolf Galland around the time of the Allied invasion of Sicily, stating of his fellow aces:

Most of them have been "on operations" as it's so aptly called for three and a half years, during which they've been flying a mission a day and sometimes several a day. They've been going along because there was no alternative. No one with any self-respect is going to stand aside while his comrades do the dirty work.³⁸

In short, due to the organization and policies of their Air Force, the circumstances of the war and their own personal conscience, the *Luftwaffe* fighter pilots of the Second World War were forced to fly into combat far more times than their opposition. Because of this fact, logically, there were many more opportunities to be successful and achieve high kill scores.

However, more opportunity does not necessarily mean more success. What must be truly discussed as the most important result of the continuousness of combat for *Luftwaffe* pilots was what they were able to perfect as a result. As with many areas of life, the more experiences one has in a certain field, the more one learns about it and how not to repeat mistakes; the *Experten* prove this to be the same with combat flying. The *Luftwaffe*, interestingly, did not have a set of guidelines for aerial warfare, and individual fighter groups and pilots were forced to develop their own unique doctrines which were tailored to their own needs.³⁹ The fact that most *Experten* were in continuous combat during the first few years of the war when they enjoyed numerical, tactical and technological advantages made possible the high extent to which such styles could be perfected.⁴⁰ For example, at the beginning of the war the *Luftwaffe* was able to perfect the tactical lessons it had learned in Spain, most notably the *Rotte* and *Schwarm* formations (two- and four-plane formations, respectively);



the latter was even adopted by their opponents because of its superiority.⁴¹ These pilots of the early years were able to “practice”⁴² against the relatively inexperienced pilots of Poland in 1939, the Western democracies in 1940, the Soviet Union in 1941 and the Americans in 1942. It is therefore tempting to think that the majority of kills were scored in the early part of the war, but as Williamson Murray argues and his Table LXXI⁴³ articulates, German kill per mission rates actually went up as the war progressed because of the experience they were able to stockpile.⁴⁴

With so much technical and tactical experience being amassed, the *Luftwaffe* pilots who survived the war’s opening campaigns, according to Williamson Murray, “had little difficulty

defeating new Allied pilots no matter how many training hours the latter had flown.”⁴⁵ Gunther Rall, for example, was able to perfect the art of deflection aerial-gunnery, while others like the legendary virtuoso Hans Joachim Marseille (158 kills) developed the tactic of diving into an enemy formation to break it up and then stalling to fire at the enemy from below.⁴⁶ Experience in combat also gave German fighter pilots the ability to, for example, differentiate between an easy and a difficult kill. Edward H. Sims’ interviews with numerous German aces are interfused with the aces’ mention of which planes were easier to down.⁴⁷ Similarly, Erich Hartmann in a 1995 interview stated: “I knew that if an enemy pilot started firing early, well outside the maximum effective range of his guns, then he was an easy kill.”⁴⁸ Throughout

the course of the war, *Luftwaffe* pilots' tactics also evolved as they met new challenges. One example, *Herausshuss*, was the tactic developed to break up an enemy bomber stream so that individual aircraft could be easily picked off.⁴⁹ It is not that *Luftwaffe* aces were without error or mistake; one thing that is remarkable about many of the top aces is the amount of times they themselves were downed. The two members of the "300 Club"—Hartmann and Barkhorn—together were shot down or crashed a total of 23 times.⁵⁰ The styles developed by aces reflected their long experience, as well as their mistakes.

Erich Hartmann, the world's most successful fighter pilot, will be discussed here to demonstrate the personalized style of combat developed by high scoring *Experten*. He was not one of the "old guard," but a young pilot who was posted to the Eastern Front in 1942. Hartmann was taught and advised by some of the greats, Walter Krupinski (197 kills), Gunther Rall, Gerhard Barkhorn and, in particular, "Paule" Rossmann (93 kills), an enlisted man and Hartmann's subordinate. Hartmann served as Rossmann's wingman, a paradox which the former claims was commonplace and was what aided *Luftwaffe* pilots in becoming the lethal veterans they were by the war's end—that is the valuing of experience over rank.⁵¹ Hartmann quickly developed his own unique and personalized style which he describes as "coming out of the sun and getting close; dog-fighting was a waste of time."⁵² Edward H. Sims describes this tactic in detail, noting that the secret of Hartmann's success lay in inflicting the maximum amount of damage. It was achieved by getting as close as possible to his victim (sometimes too close as he on several

occasions flew into the debris of his kills), while the entire time exposing his own plane to the minimum amount of danger.⁵³ Sims makes the judgment that such tactics reflect "a steadiness and concentration which enable him to execute flying and gunnery patterns in the right conditions with consistent effectiveness."⁵⁴ The hit-and-run tactics favoured by many aces like Hartmann reflect his attitude that "kills are less important than survival."⁵⁵ What Hartmann's style exemplifies most of all is that the *Experten* were not necessarily marked by stereotypical characteristics, such as dog-fighting and flying circles around the enemy, but rather proved that exemplary results can be attained through discernment, patience, intelligence and calculated risk.

As has been noted, during the opening years of the war the Germans enjoyed a technical advantage in the air, particularly when it came to fighters. The mainstay of the *Luftwaffe* fighter arm was the Messerschmitt (Me)-109, a single-engine fighter, which first flew in 1935.⁵⁶ This figurehead fighter came to symbolize the *Luftwaffe* and was flown by virtually all the *Experten*. (Some like Hartmann used it exclusively.) At the beginning of the war the Me-109 was "probably the best high altitude fighter in the world,"⁵⁷ and was commonly armed with more powerful weaponry than its British counterparts, in particular the Hurricanes and Spitfires.⁵⁸ Contrary to popular belief, when Adolf Galland uttered the now infamous phrase, "I should like an outfit of Spitfires for my group," to Hermann Goering in 1940, his motivations were, according to his memoirs, anything but the view that the Me-109 was inferior.⁵⁹ Using such superior equipment over the Allies in 1939-40 and especially the Soviets



Source: http://en.wikipedia.org/wiki/File:Bundesarchiv_Bild_1011-379-0015-18_Flugzeuge_Messerschmitt_Me_109_auf_Flugplatz.jpg

in 1941, it is easy to see how German fighter pilots with superior training and experience could capitalize on such an imbalance, further providing them with the time and “practice” to perfect their styles. As author Martin Caidin comments, “a seasoned veteran with a superior airplane has a lot going for him under these conditions.”⁶⁰ In the later years of the war, it is a commonly held belief that *Luftwaffe* fighters were outclassed by Allied ones, particularly the P-51 Mustang. However, the *Experten* were never as outclassed as their opponents had been in the war’s early years.⁶¹ Flying new model Me-109s and FW (*Focke-Wolfe*)-190s, the *Experten* still had extremely powerful and effective weapons at their disposal, and so their success cannot be said to be technologically unrealistic. For example, after March of 1941 the few *Luftwaffe* squadrons left on the Western Front were equipped with the best pilots as well as the newest and best fighters.⁶² The most important technological advantage of the *Luftwaffe* was undoubtedly the Me-262 jet fighter, which—when piloted by the *Experten* of JV44-Galland’s jet-fighter wing—consistently penetrated Allied fighter escorts and downed bomber after bomber even at 100-to-1 odds.⁶³ With the best pilots, given the best equipment the *Luftwaffe* had to offer, it is therefore more clearly understood how such pilots could score high victory counts.

Perhaps as important as the length of time that *Experten* had at the controls in combat is the fact that *Luftwaffe* pilots for the vast majority of the war were outnumbered; therefore they never had difficulty in finding a target, and each target was an opportunity to score a victory.⁶⁴ It is well known that by the war’s latter years the *Luftwaffe* was vastly outnumbered on both fronts; as Gunther Rall comments, “We were opposed by a tremendous number of fighters as the war progressed.”⁶⁵ The industrial might of Germany’s enemies (notably the United States and the Soviet Union), the focus of the German high command on bomber manufacture over fighters, and the attrition which years of continuous combat produced meant that such a disparity was inevitable.⁶⁶ On the

Eastern Front, the disparity between the Soviets and the Germans was much greater than what “The Few” had contended with in 1940 against the *Luftwaffe*. Not only so, but the German fighters had to cover a much greater area than the Royal Air Force had had to, meaning that there were even less friends in the sky to compete with for kills. Lastly, their bases were located near the front so as to always be near the enemy.⁶⁷ In 1944, Erich Hartmann claims the odds were 20-to-1 against the *Luftwaffe* in the Soviet Union.⁶⁸

In looking at a 10-day period when ace Joachim Brendel (189 kills) shot down 20 enemy aircraft, one should consider that he had encountered 289 enemy aircraft; such a kill percentage being just shy of only seven percent.⁶⁹ As a whole the Soviet Air Force lost approximately 80,000 aircraft during the war; it is thus by no means unbelievable that Erich Hartmann downed 0.44 percent of them.⁷⁰ For much of the war, skilled and veteran pilots were flying effective and high class fighters, were in continuous combat and were presented with an overwhelming abundance of targets. It is, therefore, completely logical to conclude that such amazing records of downed aircraft as the *Experten*’s were plausible. This is perhaps best captured in Johannes Steinhoff’s



Straits of Messina in which he is berated by a superior officer, who scathingly states. “When I tell you that the Allies have about 5,000 aircraft against our 350 you’ll be able to calculate the enormous number of chances you have to shooting them down.”⁷¹

The last element which provided the *Luftwaffe Experten* with the ability to achieve such monumental success was the psychological advantage of which they often made use. From its secret beginnings, Minister of War Werner Von Blomberg wanted only aggressive, confident pilots in the *Luftwaffe*. In the opening stages of both the Western and Eastern wars, fighter pilots enjoyed the knowledge and confidence that they possessed better machines, experience, leadership and tactics than their opponents, and this was an invaluable weapon to have.⁷² Even when

many of these advantages deserted them, *Experten* like Galland fought and deceived to get behind the controls of a fighter. Their determination was perhaps best demonstrated in Galland’s famous jet fighter wing, JV44, to which “[m]any reported without consent or transfer orders. Most of them had been in action since the first day of the war, and all had been wounded, all bore the scars of war and displayed the highest medals,” but still they wanted to take to the air.⁷³ Galland, in his memoir *The First and the Last*, asserts that “Only the spirit of attack borne in a brave heart will bring success to any fighter aircraft, no matter how highly developed it may be.”⁷⁴ It was this spirit of attack which Galland credits to the German fighter arm. Erich Hartmann states of himself, “I was ambitious and eager. I can’t think that any fighter pilot...would not have these qualities.”⁷⁵ In sum, the *Luftwaffe* aces had an advantage because they knew that they were superior pilots, so much so that Hartmann could not “recall any one talking of defeat” in his unit.⁷⁶ This confidence and psychological advantage can be seen not only in the actions of *Experten* but also in their adversaries. Hartmann, in fact,

Within the first four weeks of the invasion, over 5,000 Soviet aircraft were destroyed, and German pilots achieved kill ratios that were unheard of in the history of aerial warfare.

Painted a black “tulip” design on the nose of his plane and when formations of Soviet planes saw the design, they would break up and flee.⁷⁷ The element of confidence in their experience, machines and each other was what allowed *Experten* to fly against such overwhelming odds and to score such amazing successes.

Time and again, the issue of combat on the Eastern Front has been raised to cast doubt on the success of the *Experten*. This theatre is where many of the top scorers had most of their victories, and many skeptics claim that aerial combat against the Soviets was somehow “easier” and therefore, did not require superior piloting. A detailed look at the facts leads to the conclusion that this supposition of easiness (as is meant by such skeptics) is true, but only for the early part of the war. When Germany

invaded the Soviet Union in 1941, the elite pilots of the *Luftwaffe* were pitted against an ill-prepared Soviet Air Force. Within the first four weeks of the invasion, over 5,000 Soviet aircraft were destroyed, and German pilots achieved kill ratios that were unheard

of in the history of aerial warfare. Steinhoff characterized it as “like shooting ducks.”⁷⁸

There are numerous facts to justify this effortless scoring season, such as the element of surprise as well as superiority in experience, aircraft and tactics all of which the *Luftwaffe* enjoyed. However, as authors Constable and Toliver vehemently argue, this assertion of “easy” combat quickly became a fallacy after six months.⁷⁹ Gunther Rall confirms this sentiment: “[A]t the beginning...we had experience, and it was easy. Later it became much more difficult.”⁸⁰ A look at the facts confirms that this is an understatement. The official history of the Soviet Air Force declares, “As our aircraft increased in numbers and improved in quality, battle skills were learned and assimilated.”⁸¹ Technologically, when the Soviet Union began receiving lend-lease aircraft from the Western powers including Hurricanes and Spitfires as


well as producing in large numbers many of their own high quality front-line aircraft, aerial combat was far more difficult.⁸² In fact, Constable and Toliver wonder how, considering that Soviet made aircraft like the MIG-3 were faster and more manoeuvrable than their German equivalent (the Me-109F-3), the Germans managed to do so well at all.⁸³ Not only did Soviet technology advance, the skill of their pilots must also be taken into account. While it cannot be argued that in 1941 there were many Soviet pilots of inferior quality to their Allied or German counterparts, it must also be noted that by the war's end the Soviet Air Force produced many skilled and elite pilots as well. The Soviet Union's two highest scorers, Ivan Kojedub (62 kills) and Alexander Pokryshin (59 kills), who enjoyed numerical superiority like their Allied counterparts, achieved scores well over those of top Allied aces like the Royal Air Force's Johnnie Johnson (38 kills).⁸⁴ In short, the enemy that the *Luftwaffe* faced after 1942 was very different than that of the previous year, as it included elites such as the famous Red Banner units which were praised by *Experten* like Hartmann as being "skilled and disciplined pilots."⁸⁵ Furthermore, many Eastern Front aces did fight against the Western Allies and were victorious, such as Hartmann who downed seven of the vaunted American P-51 Mustangs in a few days.⁸⁶ What becomes clear, through an investigation of historical fact, is that on the Eastern Front the Germans gradually lost their initial advantages in aircraft numbers, technology, tactics and aircrew experience (often through attrition) so that by the last year of the war not even an *Experten* "could ever be sure that he was not going to run into the fight of his life over the Russian Front."⁸⁷

What is equally important about the Eastern Front is that it must be looked at as being a different type of warfare altogether from that of the Western Front for the *Luftwaffe* and its pilots. The conditions in the East as a whole for *Luftwaffe* pilots were, to put it mildly, harsh. For every advantage that *Luftwaffe* pilots had over the Soviets, there was a disadvantage which made flying, and life in

general, abysmal. In flying from mostly dangerous dirt airstrips (often within range of enemy artillery and close to the front lines) and most importantly also fighting the harshest enemy of all—the Soviet winter—life for *Luftwaffe* personnel was not ideal for keeping pilots able to fly and fly well.⁸⁸ Likewise, the pilot shortages which the *Luftwaffe* experienced as the war progressed produced less-experienced and poorly-trained young pilots who were thrown into battle alongside *Experten* but were unable to provide them effective support or protection.⁸⁹ *Experten* did not just have to worry about the enemy; their own pilots—who were destroying three aircraft by accident for every four destroyed by the enemy—were also a concern.⁹⁰ Gunther Rall, when asked if fighting on the Eastern front was easier, provided perhaps the most important reason why this was not so: "I really can't say it [fighting in the East] was ... because psychologically, flying over the Soviet Union was pretty bad."⁹¹ To pilots like Rall, the prospect of being shot down over the Soviet Union was terrifying. The treatment of *Luftwaffe* prisoners, most notably the top aces, was brutal; men like Erich Hartmann had 10,000 ruble prizes on their heads and were held illegally for 10 years in Siberia by the Soviets at the war's end. Erich Ruddorffer (222 kills) similarly noted the brutality of the war and the lack of the romantic chivalry sometimes displayed on the Western Front.⁹² In short, the war in the East for *Luftwaffe* fighter aces was much worse as a whole than that of Western Front pilots. Perhaps the kills had been easier for a short time, but the conditions they endured and the psychological strain and terror they faced must be taken into account and drawn upon as evidence against any claim that fighting in the Soviet Union was "easier" or that Eastern Front *Experten's* achievements should not receive high accolade.

This work has discussed and documented the amazing success achieved by *Luftwaffe* aces in the Second World War. When looking at the historical facts one might assume, as historian Ronald P. Beaumont does when he states, "The German fighter pilot seemed no better

than ours,”⁹³ that the achievements and skill noted here of the *Experten* applies to the *Luftwaffe* fighter arm as a whole. Such is not the case. As highest Royal Air Force scorer (and ironic skeptic of some *Experten* claims) J. Johnson stated, “the kills in any squadron always seemed to fall to the same few pilots.”⁹⁴ It is so with the *Luftwaffe* as well, which suffered atrocious attrition rates throughout the war. It was also divided into the *Experten* who had become so superior they could tackle any enemy successfully and, in the words of Williamson Murray, “the great mass of pilots who faced great difficulty in landing their aircraft, much less surviving combat.”⁹⁵ In this work, the *Experten*’s successes have been proven to be not only rational, but probable given the circumstances which unfolded around them. It has been proven that the *Experten*, even from before the war, enjoyed superior experience, tactics and vocational know-how. Furthermore, this work has also proven that when war did start it thrust upon the *Experten* circumstances such as the “practice”

periods of the *Blitzkrieg* in 1940 and Operation Barbarossa in 1941, the high level of technology at hand, the overwhelming supply of targets, the sheer amount of time in the cockpit and, lastly, the confident aggressive spirit that infused them. With such circumstances it is little wonder that they achieved what they did. The *Experten* racked up hundreds of kills, not only in the less than “easy” conditions of the air war on the Eastern Front, but also against the Western Allies where pilots such as Adolph Galland and Hans-Joachim Marseille scored 100-plus kills each against solely Allied pilots. As a result it can now be confidently maintained that the success of the *Experten* was not simply the product of Nazi propaganda thrust on romantic ears, as E. R. Quesada and R. P. Beaumont claim, but was the logical and inevitable achievement of gallant and chivalrous aerial warriors the likes of whom will probably never be seen again. The Second World War spelled the end of their era, the doom of the *Experten*, it was their “Twilight of the Gods”—their *Götterdämmerung*. 

.....

Colin Gilmour is a historian with a lifelong interest in military aviation. Entering (in September 2009) his fourth year at Queen’s University in Kingston, Colin is pursuing an honours degree in History and Classical Studies. His specific fields of interest in modern history are the Second World War and the Napoleonic period. Colin intends to pursue graduate studies in the field of military history upon graduation from Queen’s in 2010.

Bibliography

Bailey, Ronald H. *The Air War in Europe*. Edited by Editors of Time Life Books. Alexandria, VA: Time Life Books, 1979.

Barker, Ralf. *The RAF at War*. Alexandria VA: Time Life Books, 1981.

Caidin, Martin. *ME-109: Willy Messerschmitt’s Peerless Fighter*. New York: Ballantine Books Inc., 1968.

Collier, Basil. *History of Air Power*. London: Wiedenfeld and Nicolson, 1974.

Constable, Trevor J., and Colonel Raymond F. Toliver (Retired). *Horrido: Fighter Aces of the Luftwaffe*. New York: Macmillan Company, 1968.

Deighton, Len. *Fighter: The True Story of the Battle of Britain*. London: Jonathan Cape, 1977.

Editors of Time Life Books, eds. *The Luftwaffe*. Alexandria, VA: Time Life Books, 1982.

Emme, Eugene M., *The Impact of Air Power: National Security and World Politics*. Princeton: D. Van Nostrand Company, 1959.

Galland, Adolf. “Defeat of the *Luftwaffe*.” In “Defeat of the *Luftwaffe*: Fundamental Causes.” *Air University Quarterly Review* (Spring 1953). In Emme, Eugene M. *Impact of the Air War: National Security and World Politics*. Princeton: D. Van Nostrand Company, 1959.

Galland, Adolph. *The First and the Last: The German Fighter Force in World War II*. Translated by Mervyn Savill. London: Methuen & Co. Ltd, 1970.

- Goering, Hermann. "A Nation of Flyers." In E. Gritzbach, *Hermann Göring und Aufsätze*, Munich:1939. Translation in H. W. Blood-Ryan. *The Political Testament of Hermann Goering*, London: 1940. From Emme, Eugene M. *Impact of the Air War: National Security and World Politics*. Princeton: D. Van Nostrand Company, 1959.
- Guttman, Jon. "Greatest Fighter Aircraft of WWII." *World War II Magazine* 14, no. 7 (March 2000) 42–57.
- Halliday, Hugh. *The Tumbling Sky*. Stittsville, ON: Canada's Wings, 1978.
- Heaton, Colin D. "Colonel Hajo Hermann: Master of the Wild Boars." *World War II Magazine* 15, no. 2 (July 2000): 30–6, 78, 80.
- Heaton, Colin D. "Final Thoughts of the Blond Knight." *World War II Magazine* 17, no. 3 (September 2002): 30–42, 85.
- Hess, William N. *Famous Airmen: The Allied Aces of World War II*. New York: Arco Publishing Co., 1966.
- Lindemans, Micha F. "Gotterdammerung." In Encyclopedia Mythica. Available online at <http://www.pantheon.org/articles/g/gotterdammerung.html> (accessed December 1, 2008).
- Murray, Williamson. *Strategy of Defeat: The Luftwaffe 1933–45*. Maxwell Air Force Base, VA: Air University Press, 1983.
- Shores, Christopher. *Air Aces*. Greenwich, USA: Bison Books Corp., 1983.
- Sims, Edward H. *Fighter Tactics and Strategy 1914–1970*. New York: Harper & Row Publishers, 1972.
- Steinhoff, Johannes. *The Straits of Messina*. Translated by Peter and Betty Ross. Andre Deutsch, 1971.
- Wagner, Ray, ed. *The Soviet Air Force in World War II: The Official History, Originally Published by the Ministry of Defence of the USSR*. Translated by Leland Fetzer. Garden City, NY: Doubleday & Company, Inc., 1973.

Notes

1. *Encyclopedia Mythica*, s.v. "Gotterdammerung" (by Micha F. Lindemans) <http://www.pantheon.org/articles/g/gotterdammerung.html> (accessed December 1, 2008).
2. Christopher Shores, *Air Aces* (Greenwich, USA: Bison Books Corp., 1983), 6; Hugh Halliday, *The Tumbling Sky* (Stittsville, ON: Canada's Wings, 1978), 2; and William N. Hess, *Famous Airmen: The Allied Aces of World War II* (New York: Arco Publishing Co., 1966), 3.
3. Martin Caidin, *ME-109: Willy Messerschmitt's Peerless Fighter* (New York: Ballantine Books Inc., 1968), 141.
4. Trevor J. Constable and Colonel Raymond F. Toliver (Retired), *Horrido: Fighter Aces of the Luftwaffe* (New York: Macmillan Company, 1968), 14, 16.
5. *Ibid.*, and Len Deighton, *Fighter: The True Story of the Battle of Britain* (London: Jonathan Cape, 1977), 278.
6. Constable and Toliver, 16.
7. *Ibid.*, 17.
8. *Ibid.*, xiv.
9. Shores, 7.
10. Deighton, 276–9.
11. Constable and Toliver, 83–4.
12. *Ibid.*
13. *Ibid.*, 91.
14. Edward H. Sims, *Fighter Tactics and Strategy 1914–1970* (New York: Harper & Row Publishers, 1972), 176.
15. Constable and Toliver, 83–91.
16. Hess, 3.
17. *Ibid.*, 6–7.
18. Constable and Toliver, 14–15.
19. *Ibid.*, 16.
20. Hermann Goering, "Nation of Flyers," in E. Gritzbach, *Hermann Goering und Aufsätze* (Munich: 1939), trans. in H. W. Blood-Ryan, *The Political Testament of Hermann Goering* (London: 1940), 104–7. From: Eugene M. Emme, *Impact of the Air War: National Security and World Politics* (Princeton: D. Van Nostrand Company, 1959), 56.

21. Ibid., 55.
22. Adolf Galland, *The First and the Last: The German Fighter Force in World War II*, trans. Mervyn Savill (London: Methuen & Co. Ltd, 1970), 1–10; Colin D. Heaton, “Final Thoughts of the Blond Knight,” *World War II Magazine* 17, no. 3 (September 2002), 32; Colin D. Heaton, “Colonel Hajo Hermann: Master of the Wild Boars,” *World War II Magazine* 15, no. 2 (July 2000), 31; and Sims, 134.
23. Williamson Murray, *Strategy of Defeat: The Luftwaffe 1933–45* (Maxwell Air Force Base, VA: Air University Press, 1983), 4–5; Deighton, 140.
24. Deighton, 142–3.
25. Constable and Toliver, 27.
26. Galland, 23.
27. Ibid., 38; Deighton, 139; Basil Collier, *History of Air Power* (London: Wiedenfeld and Nicolson, 1974), 115.
28. Deighton, 140.
29. Constable and Toliver, 6.
30. Ibid., 110–111. The “300 Club” was those pilots (Erich Hartmann and Gerhard Barkhorn) who scored over 300 victories.
31. Murray, 312.
32. Sims, 173; Heaton, “Final Thoughts of the Blond Knight,” 39.
33. Sims, 139.
34. Murray, 209.
35. Hess, 3.
36. For data on *Luftwaffe* fighter pilot loss from the period January 1943 to May 1944 see Tables XXXVIII (page 187), XLIV (page 227) and LIII (page 240) in Murray, *Strategy of Defeat*.
37. Ronald H. Bailey, *The Air War in Europe*, ed. Editors of Time Life Books (Alexandria, VA: Time Life Books, 1979), 144.
38. Johannes Steinhoff, *The Straits of Messina*, trans. Peter and Betty Ross (Andre Deutsch, 1971), 86.
39. Eugene M. Emme, *The Impact of Air Power: National Security and World Politics* (Princeton: D. Van Nostrand Company, 1959), 250.
40. Constable and Toliver, 203.
41. Sims, 92.
42. That is to develop their combat skills.
43. Murray, 315.
44. Ibid., 312.
45. Ibid., 312.
46. Constable and Toliver, 84 and 124.
47. Sims, 135.
48. Heaton, “Final Thoughts of the Blond Knight,” 38.
49. Constable and Toliver, 17; Murray, 225.
50. Heaton, “Final Thoughts of the Blond Knight,” 34; Constable and Toliver, 111.
51. Heaton, “Final Thoughts of the Blond Knight,” 33.
52. Ibid., 33.
53. Sims, 204–206.
54. Ibid., 206.
55. Heaton, “Final Thoughts of the Blond Knight,” 33.
56. Collier, 108–9.
57. Sims, 89.

58. Collier, 167.
59. Galland, 79.
60. Caidin, 141.
61. Jon Guttman "Greatest Fighter Aircraft of WWII," *World War II Magazine* 14, no. 7 (March 2000): 45.
62. Murray, 134.
63. Galland, 353.
64. Hess, 3.
65. Sims, 148.
66. Bailey, 147; Constable and Toliver, 5; and Sims, 158.
67. Constable and Toliver, 197 and 204.
68. Heaton, "Final Thoughts of the Blond Knight," 36.
69. Constable and Toliver, 207.
70. *Ibid.*, 197.
71. Steinhoff, 80.
72. Murray, 5; and Constable and Toliver, 13–14.
73. Galland, 353.
74. *Ibid.*, 59.
75. Heaton, "Final Thoughts of the Blond Knight," 35.
76. *Ibid.*, 35.
77. *Ibid.*, 36; and Editors of Time Life Books, eds., *The Luftwaffe* (Alexandria, VA: Time Life Books, 1982), 132.
78. Constable and Toliver, 13.
79. *Ibid.*, 197.
80. Sims, 147.
81. Ray Wagner, ed., *The Soviet Air Force in World War II: The Official History, Originally Published by the Ministry of Defence of the USSR*, trans. Leland Fetzer (Garden City, NY: Doubleday & Company, Inc., 1973), 119.
82. Shores, 100; and Sims, 148.
83. Constable and Toliver, 197.
84. *Ibid.*, 149.
85. Heaton, "Final Thoughts of the Blond Knight," 33.
86. *Ibid.*, 37.
87. Constable and Toliver, 205.
88. Steinhoff, 224; Constable and Toliver, 191; and Murray, 88.
89. For a comparison of flying hours in British, American and German training programs see Table LXX in Murray, *Strategy of Defeat*, 314.
90. Murray, 94–96; and Emme, 253.
91. Sims, 148.
92. Sims, 175; and Heaton, "Final Thoughts of the Blond Knight," 42.
93. Caidin, 141.
94. Sims, 158.
95. Murray, 312.

THE ROLE OF AIR POWER



Composite by CFAWC.

**AIR COMMODORE K. L. B. HODSON, OBE, DFC, CD
TO THE CANADIAN ARMY STAFF COLLEGE
KINGSTON, ONTARIO, 18 APRIL 1955**

Air power used to be a provocative and controversial subject. In its beginnings, its advocates violently overstated their case in a deliberate and sometimes successful attempt to attract the support necessary to allow air forces to demonstrate their abilities. Latterly, of course, nuclear weapons have given air power such a fantastic capability as to incite public apprehension and horror, and certainly to provoke wide-spread interest. Since nuclear weapons dominate the military and political scene, any general discussion of the roles of the Armed Services must be based on an examination of the weapon itself. I propose therefore to start with a brief discussion of the effects of the advent of nuclear weapons, and to develop from there the type of tasks that air forces may be called upon to play.

The principal weapon of an air force is, of course, the bomb. The airman has always believed that he could force a decision by strategic bombardment. In World War II, which was the first and only opportunity he has had to prove this contention, the airman is forced to admit that he did it the hard way. He did it the hard way because he lacked experience and precedent, and consequently made time-consuming mistakes in his choice of target systems and because he entered the war unprepared to carry out effective bombing. In 1939 his largest bomb weighed 500 pounds, had been made in 1919, and sometimes exploded when it should. It was not until 1943 that even a 1,000 pound bomb was produced. By the end of the war, a 22,000 pound bomb was in use and a 45,000 pound one was under development. Similarly, his bomber force was too small, too slow, and could not find its target. So the first four years of the war were lost in developing a respectably sized bomb and building up an effective force which could find its target. During the last two years

of war the combined British and American bomber commands really went to work and dropped some two million of the total of 2,700,000 tons of bombs released on Germany throughout the entire period of the war.

This drawn-out time factor is important to remember. The airman's concept has always been that he does not first have to disarm the enemy's military forces but that he can strike immediately at the enemy's industrial complexes. By systematically [sic] destroying these, he can reduce the enemy's means, and hence his will to continue the war. The airman

claims that the bomber will always get through. But the longer the period over which the bomber must continue to get through owing to an inability to force a quick decision, then the more time the enemy has first to build up a reaction to the attacking force and second, to repair the damage.

**THE PRINCIPAL
WEAPON OF AN
AIR FORCE IS,
OF COURSE,
THE BOMB.**

The enemy's reaction, of course, introduces the air battle. It was obvious, that while our bomber forces were directed straight to the enemy's heartland, nevertheless they had to battle the enemy's air forces to arrive at their targets. The Battle of Berlin, for example, lasted four months and cost the RAF 300 four-engined aircraft. It was this air fighting which would decide whether the RAF was going to continue to be able to bomb Berlin or whether we should have to give up. Certainly having to fight the battle, reduced the effectiveness of our bombing. Conversely, preoccupation with this battle, the outcome of which meant life or death, caused the enemy to re-allocate his forces, from bombers to fighters, from offence to defence, from front-line troops to fire fighters, with far reaching effects on his production plans, and on his over-all conduct of the war. From the airman's point of view: since he did not have the weapon to knock out the enemy's production

quickly, then the continuing air battle provided the occasion to exert a powerful influence on the enemy's conduct of the war.

The long drawn-out nature of the air campaign against Germany has permitted doubt as to air power's decisiveness. As we have seen, destruction was necessarily spread over several years and inflicted by concentrating on one place at a time. This manner of attack gave a determined and resourceful enemy the opportunity to do repairs and as we know now, to convert the easy-going peacetime economy, with which he had hoped to finish the war, to full-out war production. These two factors made the effects of destruction difficult to evaluate and lead to the US government appointing a strategic survey team comprising civilians and military personnel to make an unbiased report. The findings which are probably well known to you were summarized as follows: "Allied air power was decisive in the war in Western Europe. Hindsight inevitably suggests that it might have been employed differently and better in some respects. Nevertheless it was decisive." By decisive, the survey meant that in the closing months of the war, air bombardment reduced German armament production 50%, the output of coal (the key to the German economy) 90%, dried up the flow of oil, made a complete mess of transportation, grounded the German Air Force, stopped the tanks, and in short, brought the German machinery of production to a grinding halt. So much for decisive. Finally, the survey emphasized that air power during World War II was still in its adolescence and would obviously go on developing.

A pre-requisite to the success of the bomber offensive against Germany was the availability of the UK as a highly-developed industrial base close enough to the target areas to permit the growing bomber forces to sustain their attacks with enough frequency and power to saturate the enemy's defences and thus gain freedom of access to the target. When we consider attack against Russia, we do not find the same situation since the Allies do not possess an industrial area within easy reach. In terms of conventional HE, it is extremely doubtful whether an air

attack could be made sufficiently heavy and sustained to force a decision. Probably the airman would go on making his claims but he would be hard pressed to support them.

Unfortunately, there now exists a weapon which eliminates the need to get in close and to visit a target more than once. If we modernize the figure by putting in a decimal point we realize that the 2.7 megatons of bombs poured on Germany during the whole of World War II is but the equivalent of a small hydrogen bomb.

The importance of this comparison lies once again in the time factor. The fire power applied by two tremendous bomber forces working around the clock for several years can now be matched by one bomber dropping one bomb in one awful night. To be sure, one bomb can only be dropped on one place. But that place can be reasonably large. The 1954 Bikini tests showed lethal radiation from a single hydrogen bomb spreading over 7,000 square miles. The total area of England is only 51,000 square miles. Our Air Defence Command considers that in terms of cities, one bomb will destroy one target. This then gives a small attacking

force the capability of achieving with no warning a much more complete destruction and over a wider area than resulted from the cumulative campaigns of World War II.

This destructive power comes at a time when the high-speed, jet bomber force has a marked advantage over the defence for a number of technical reasons which do not need to be enlarged on here. Moreover, our experience of defence has been against sustained attacks where there was time to take toll of the attacking

force - anything better than about 10% attrition would do the trick, in time. But today in the face of this instantaneous and complete destruction there is no time. We need to inflict an attrition of something much better than 90% and, of course, every effort is being made to develop such a defence. But we do not have it. We conclude, therefore, that, at the moment, we cannot prevent an attacking bomber force from creating more damage, physical and psychological, to our populated area than we are capable of absorbing. Hence, the best defence, indeed the only defence, is a retaliatory offence.

There is another factor that must be added. Unfortunately, the Russian has the initiative to strike first. There is often talk of a preventive war on

our part, but such premeditated action hardly seems compatible with our Western conscience. Hence I believe that we must give the enemy the advantage of being allowed to strike the first blow. Since an apprehensive enemy would obviously give consideration to aiming at least a part of this blow at our strategic bomber force, then protective measures must be taken to ensure that the force can indeed get on its way. By such measures as dispersal of the bomber force on a multitude of strategically located bases, early warning networks and active defences, there is reason to believe that the security of a reasonable portion of the bomber force can be assured. Fortunately this same air defence system serves the populated areas. How much air defence is necessary, how much we can afford, are matters of fine judgment - of political judgment. The minimum required, however, is that measure of defence which can give assurance of the strategic bomber force being able to make its retaliatory attack in the face of a prior onslaught by the enemy.

If both sides subscribe to the truism that after war comes peace, then it must be admitted that the simultaneous suicide committed by a thermo-nuclear [sic] war profits neither the original aggressor nor the supposed victim who is in a position to retaliate. So long as the Allies are able to pay back in full, there is just no incentive for the Russian to strike first. Thus, the Allied strategic air forces stand as the deterrent force against atomic war. Since it is unreasonable to suppose that the Allies could beat the Russians with conventional weapons in the face of the disparity of forces that now exists, then strategic air forces armed with nuclear weapons stand as a deterrent to major war of any nature. This then is the prime role of air forces today - to act as a deterrent force against another world war.

This deterrent role postulates a continuous effort of research, development and production to maintain in being a striking force which can give clear evidence of being able to reach enemy targets and a system of defence which assures that an adequate proportion of this force will get safely on its way even in the face of an initial, surprise attack by the enemy.

This deterrent concept, if you accept it, introduces some disturbing changes in our traditional thinking. It points to a radical revision in our ideas of timing, mobilization, use of reserve forces, and general allocation of resources. It suggests, for example, that we reveal to the enemy in time of peace what we can do instead of maintaining our usual security. It points to a force in being rather than to one in prospect, and hence to a far greater military preparedness in peacetime. Air forces are bringing their two essential ingredients of attack and defence to a continuous state of 24-hour readiness - a heavy commitment in resources and in nervous strain. The deterrent force which has kept Russian military power within bounds during the dangerous post-war period of Allied disarmament is proving a hard task-master.

Of course, this is only a part of the story. This deterrent force plays the role of an expensive insurance policy. And like all insurance, as long as things go well it seems to return nothing and we begrudge the heavy premiums. While the policy will save us from being wiped out financially, there are a dozen and one small items of small print which are not covered and which we have to make good ourselves.

The small war is one of these items in the small print. It would appear that unless other measures are taken, the application of the deterrent force concept does not protect us against the possibility of the local war, after the pattern of Korea. In fact, human nature being what it is, we might suspect that once the major war is removed as a way of achieving political aims through other means, we would be tempted to turn to the small war.

A small war is normally one in which the use of air is deliberately restricted; otherwise it would not remain a small war for very long. Hence, the onus of fighting the small war falls on ground and air forces working together and supported by sea forces. The contribution made by air forces depends certainly on the size and efficiency of the air formations but also upon the time and space in which they are permitted to operate. In Korea, for example, when

the Allied ground forces were pushed to the bottom of the peninsula and air was allowed the full sweep to the Yalu, the contribution was effective and made up for the disparity of numbers on the ground. However, when our forces had pushed north to the limits of North Korea, at which point the Chinese Communists swept in, then air forces which now had no room nor time to take effect were not able to do very much. This kind of limitation is a very important factor in fighting small wars.

The small war provides us with the lesson of the importance of recognizing clearly our political objectives. In a local war these will of necessity be of a limited nature and often of a very special nature. It is most important, therefore, that the overall campaign be conducted strictly to achieve these aims. These political objectives as well as the relative capabilities and limitations of ground versus ground and air versus air should decide whether air forces will be employed in support of the ground situation or whether ground forces should be used to exploit to the full the air situation. This recognition of air as an equal partner to ground forces in fighting the small war will make for a more flexible and more economical use of resources than does the widely-held rigid concept that considers air solely in the form of an adjunct to the ground forces.

This being the case, air forces will be carrying out the normal tasks of attacking enemy airfields, air fighting, reconnaissance, interdiction, close support, air evacuation, air supply, and so on. Again, the overall objectives, the opportunities and vulnerabilities will indicate the proper apportionment of effort between interdiction, which the airman favours, and close support which the soldier always feels that he requires. This then is a second role of air forces - to combine with ground forces in fighting the small war.

These small wars are not proving of advantage to the Allies and there may be an important way whereby air forces can help to prevent them. The present trend is towards building up strategic reserves of combat forces. When aggression is obviously stirring in a certain area,

large numbers of these combat forces could be moved in, practically overnight, by the mass use of air transport. The sudden change in the balance of military forces might shock the would-be aggressor into changing his intentions. The bold, swift move of large forces from one side of the world to the other would be accompanied by positive propaganda explaining these measures as necessary to keep the peace. The Berlin Airlift provided an example of how the timely use of air transport can thwart a sinister political manoeuvre which might have led to a shooting war. We have not had the occasion to repeat that successful exercise. But the bold and imaginative use of the carrying power of air forces, properly exploited by skilful propaganda, should be kept in mind as a means of playing policeman in troubled areas.

A surer way of preventing small wars is accomplished by the regional alliance - as exemplified by the North Atlantic Treaty Organization. Here, the several nations have joined together to form a system of collective defence. This physical manifestation of military force, of which air forces are a part, in effect, draws a clear-cut line between the Western Nations and Russia. These defence forces support the unequivocal announcement, that an overt attack by the Russian against a single member means war with all the members. And since they cannot defend themselves adequately with conventional weapons they will doubtless be forced to use thermo-nuclear weapons, - and the big war will be on, - with the NATO nations taking cover behind the deterrent force.

But NATO does more than that. The physical presence of Allied forces, particularly those from outside Europe - British, American and Canadian, - provides strong support for the Western European governments and goes a long way towards preventing internal overthrow by Communist elements. In the same way, in Western Germany the Allied occupation forces have prevented the seizure of the Bonn Government by Communist forces of East Germany. So here we see air forces, in conjunction with armies, undertaking the somewhat unaccustomed role of supporting the properly constituted democratic governments of Western

Europe. Air Forces are not as adaptable to this role as are ground forces, but I believe that the Canadian and US airmen who parade many times a year in historic old Metz, are playing a significant part in restoring Western Europe to political and economic stability.

Finally, the wide-flung nature of our alliances presents the age-old requirement to ensure the security of sea-lines of communication. Certainly, the theme of the short, thermo-nuclear war suggests that we reappraise the forces that we have allocated to this task. However, I believe that sea lines are an integral part of our defence system that we just don't dare leave unprotected for fear that the enemy take advantage of this weakness and use it to good account in the cold war. Furthermore, we cannot assure the support of our forces in a local war unless we are capable of protecting the sea lines. The enemy's temptation to interrupt [sic] these lines even at the risk of broadening the scope of the war might be proportional to the protection provided. For these reasons, air forces combine with surface forces in the continuing development of effective techniques to combat the submarine, the mine and the surface raider.

These then are what the airman believes to be the important roles of air forces; the strategic bombardment force with its necessary air defences to provide the deterrent to all-out war; tactical forces to combine with ground forces in fighting the local war; the strategic airlift to discourage small wars: [sic] cover forces stationed abroad to sustain the political health of our Allies; and maritime squadrons to join in maintaining the integrity of our numerous sea-lines of communications. In these ways the airman hopes to prevent the folly of a thermo-nuclear war; to help achieve our political aims by acquitting ourselves well in a local war if that be necessary, and ultimately by contributing to the success of our regional alliances to promote a period of stability in the world, sufficiently long to allow nations to come to realize the futility of war in this thermo-nuclear age and to resign themselves to existing together without further recourse to war.

K.L.B.H.



**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**

By Aaron P. Jackson



Introduction

In a paper published in 2002, Canadian Air Force officer Paul Johnston asserted that “[i]t has been widely observed that air forces are usually not as keen on doctrine as armies tend to be, and the Canadian Forces are certainly no exception to this rule.”¹ In the same year, *Aerospace Doctrine Study: Final Report* reached a similar conclusion: “Historically the Canadian air force has been weak in doctrinal development; very little original, independent air force...doctrine has been written.”²

As discussion herein will postulate, 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, an 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.

Among the small number of studies that have hitherto been undertaken in an effort to explain why such a culture has developed within other air forces, Robert Futrell’s study of United States Air Force (USAF) culture is probably the best known. Futrell suggested that from the outset, the nature of air forces tended to attract people with an “active” rather than a “literary” focus. During the early years of their existence, when air force culture was still emerging, the heavy criticism early air power theorists attracted (especially from within armies and navies) greatly exacerbated the existing propensity of most airmen to eschew written theories and doctrines.³

Recently, however, there have been some indications that the Canadian Air Force is beginning to shift away from this traditional cultural paradigm and that a tentative culture of doctrinal development is emerging to take its place. By 2007—a mere five years after

Johnston and the *Aerospace Doctrine Study* made the assertions quoted above—the Canadian Air Force had established an organisation responsible for doctrine development⁴ and released an innovative new doctrine manual.⁵

This is the first of two articles that examine the origin, evolution and future potential of this cultural shift. It begins by briefly examining the nature of air power theory and doctrine as well as the relationship between them. It then offers an overview of the role theory and doctrine have traditionally played within the culture of Western air forces generally and then examines the dissonance between doctrine and Canadian Air Force culture during the cold war. Drawing on this background, the second article will examine the Canadian Air Force’s attempts to develop doctrine in the period after 1975, concentrating particularly on the nature, significance and future potential of events of the past five years.

The Nature of Air Power Theory and Doctrine

From the outset, it must be made clear that “military thought and doctrine are not synonymous.”⁶ Although military theory (and several prominent theorists) have influenced military conduct for centuries, theory is not doctrine because “[t]he first is personal, the latter institutional.”⁷ Despite this difference, both theory and doctrine play important roles in the intellectual development of military organisations, and both warrant brief discussion at this juncture.

Theory is important because it plays a vital role in developing an understanding of why events occur, promoting deeper perceptions than simple historical or contemporary observations can offer. In the words of Prussian military theorist Carl von Clausewitz, theory “can give the mind insight into the great mass of phenomena and of their relationships, then leave it free to rise into the higher realms of action.”⁸ This sentiment was perhaps more clearly explained by Samuel P. Huntington:

Understanding requires theory; theory requires abstraction; and abstraction requires the simplification and ordering of reality... Obviously, the real world is one of blends, irrationalities, and incongruities: actual personalities, institutions, and beliefs do not fit into neat logical categories. Yet neat logical categories are necessary if man is to think profitably about the real world in which he lives and to derive from it lessons for broader application and use.⁹

For air forces, the development of theory has provided a mechanism to allow them to reach a deeper level of understanding about what they do as well as how and why they do it. From this deeper understanding, guidance can then be derived to enable air forces to operate more effectively.

Doctrine, on the other hand, acts as an institutional mechanism that militaries have traditionally used to express the acceptance of selected theories and concepts. In the words of one United States Army Air Force staff officer, doctrine is important because:

In any field of endeavour, private or public, the first essential is a body of working principles and the next is a clear concept of the manner of following those principles with the means at hand. Without such principles and concepts being clearly expressed, at least in the minds of the users, it is not at all possible to attain coordination and efficiency, and it is not reasonable to expect, as is desirable, that all workers to the common end will have in mind the same possibilities and objectives. In military matters... where mistakes and inconsistencies cost thousands of lives and millions of man-hours, it is all the more important that there be clearly expressed guiding principles

which are clearly understood by all planners, as well as by all who are charged with the handling of forces in the field.¹⁰

For air forces, doctrine has an important role to play in ensuring unity of purpose is achieved. It does this by formally establishing a set of principles that provide guidance for the conduct of operations.

The ideal relationship between theory and doctrine is thus a symbiotic one. As Markus Mader observed in his study of post-cold war British military doctrine development:

Doctrine is more than the formal publication of military concepts. It stands for an institutional culture of conceptual thinking on the nature of conflict and the best conduct of warfare. It is the military's instrument for analysing past experience, guiding current operations and exploring future challenges.¹¹

To ensure doctrine is a meaningful instrument in this regard, the principles espoused within it must be based upon a sound theoretical framework. This allows for a synthesis between the unity of purpose established by doctrine and the deeper understanding established by theory. In other words, the incorporation of theoretical perspectives allows doctrine to have a deeper significance than merely enabling those within a military force to "sing from the same song sheet."

As will be discussed in the second part of this article, the strength (or weakness) of the link between theory and doctrine has been a vital determinant of the success or failure of the keystone doctrine manuals produced by the Canadian Air Force since 1975.¹² In a broader sense, the story of the early development of air power theory is closely related to the cultural aversion to written doctrine that has traditionally characterised most Western air forces, including the Canadian Air Force. Given the historic roots of this aspect of air force culture, it is prudent to provide a brief overview of the early history of the theoretical development of air power.¹³

Theory, Doctrine and the Emergence of Western Air Force Culture

During the First World War, aeroplanes were initially used by navies and especially armies to conduct reconnaissance and, in the case of armies, to locate artillery targets. Counter-reconnaissance efforts soon led to the addition of interception missions to the role of aircrews and the development of technology (such as forward-mounted machine guns) soon made aeroplanes much more effective at conducting air-to-air combat.¹⁴ Another important role soon added to the growing list of missions was aerial bombardment of ground forces, which led to the development of the concept of “strategic bombardment,” something that was to have a great impact on the development of air power theory in the decade following the end of the war. During the war itself, however, air power played a comparatively minor role, as it was overshadowed by the vast land and naval campaigns that were the war’s principal characteristics.¹⁵

Nevertheless, the development of air power during the war fuelled the early theories that gained traction in its aftermath. One of the key early proponents of air power was Italian General Giulio Douhet. His most influential work, *The Command of the Air*, was first published in 1921. “To have command of the air,” wrote Douhet, “means to be in a position to prevent the enemy from flying while retaining the ability to fly oneself.”¹⁶ More importantly than establishing this definition, Douhet asserted his belief that “[t]o conquer the command of the air means victory; to be beaten in the air means defeat and acceptance of whatever terms the enemy may be pleased to impose.”¹⁷ Subsequently, he postulated that:

From this axiom we come immediately to this first corollary: *In order to assure an adequate national defense, it is necessary – and sufficient – to be in a position in case of war to conquer the command of the air.* And from that we arrive at this second corollary:

*All that a nation does to assure her own defense should have as its aim procuring for herself those means which, in case of war, are most effective for the conquest of the command of the air [emphasis in original].*¹⁸

Furthermore, Douhet envisaged a key role for strategic bombardment in future warfare, reasoning that bombardment of targets within enemy territory would “cut off the enemy’s army and navy from their bases of operation, spread terror and havoc in the interior of his country, and break down the moral and physical resistance of his people.”¹⁹

Writing during the same period, other air power theorists made similar arguments, particularly regarding the potential effects of strategic bombardment. In the United States (US), Brigadier General William “Billy” Mitchell demonstrated the potential of air power at sea in 1921 by using aerial bombardment to sink a captured German warship. In his writings, Mitchell advocated strategic bombardment as a means to win wars. Where he differed from Douhet, however, was that he did not advocate the use of air power to “spread terror and havoc” among a civilian population. Instead, he emphasised the strategic effect



Italian General Giulio Douhet
One of the key early proponents of air power.

bombardment would have on the enemy's industrial and economic infrastructure and thus on his ability to sustain a war effort.²⁰ In England, Lord Trenchard, inaugural Chief of the Air Staff of the Royal Air Force (RAF), argued that air power could be used to substitute for land power in maintaining control over the colonies. The idea was tested with mixed success during the 1920s.²¹

At the time these theories were advanced, the strategic environment facing air forces was one of fiscal constraint and strong opposition to their existence by armies and navies. In England, the newly-established RAF had to frequently fight attempts by army and naval officers to reabsorb it back into their own services.²² In the US, the air force remained a part of the Army throughout the interwar years.²³ In Canada, the Royal Canadian Air Force (RCAF) was inaugurated on April 1, 1924, but remained a semi-autonomous branch within Militia Headquarters until 1938. A mixture of funding and political constraints prevented its independent development during the intervening period.²⁴

The emergence during the 1920s and 1930s of the theoretical debate about command of the air and the potential of strategic bombardment proved to be a "double-edged sword" for fledgling air forces. On one hand, the idea that air power could prove the decisive factor in future wars provided a potent argument for its advocates to justify its funding and, more importantly, the ongoing independence of air forces. On the other hand, the theories were often overstated and the concepts they developed were still, in some cases, decades ahead of what contemporary technology could achieve.²⁵ As a result, the theories remained largely untested.²⁶

The Second World War provided a testing ground for several of the theories developed in the early 1920s, initially yielding many disappointing results for the advocates of strategic bombardment. Instead of having the effect of spreading "terror and havoc," the bombing of London during the Blitz (1940-41) and of Germany from 1941 to 1943 had the overall

effect of strengthening the resolve of civilian populations. "During the early years of World War II," wrote Alan Stephens, "the apparent failure of strategic bombing to meet its supporters' claims damaged the credibility of air power generally."²⁷

The Second World War promoted the development of air power in a different way, however. The course of the war saw the development, application and refinement of most of air power's contemporary roles. These included recognition of the importance of air supremacy,²⁸ the development of close air support (CAS) to land forces, the role of aeroplanes in the protection of sea lines of communication and the development of tactics for air-to-air combat.²⁹ Finally, the atomic bombs dropped on Japan at the close of the war reinvigorated the debate about the potential of strategic bombardment and whether or not the theory had gained a renewed applicability in the atomic age. As Mader asserted: "In sum, the Second World War witnessed the emergence of modern air power and laid the foundation for the broad spectrum of roles evolving in its aftermath."³⁰

Despite the many lessons the proponents of air power learned during the Second World War, the experience of the interwar period and the early stages of the war itself provoked widespread scepticism regarding the utility of written theory. The intense criticism that early air power theorists had attracted, the failure of strategic bombardment during the early part of the war and the ongoing gap between technology and theory (which, despite narrowing, persisted to the war's end) all combined to make most air force personnel reluctant to commit their thoughts to paper.³¹ Ongoing concerns about being absorbed back into armies and navies appear to have reinforced this aversion, and the prospect of attracting unnecessary criticism from army and naval officers dissuaded many within air forces from recording theoretical developments. The result was that within Western air forces, including the RCAF, a strong oral (rather than written) tradition of passing lessons from senior to junior officers developed.³²

Doctrine and Canadian Air Force Culture during the Cold War

Prior to the Second World War, the RCAF based much of its organisational culture on that of the RAF, something that was reflected in its doctrine.³³ Although a uniquely Canadian culture began to emerge during the Second World War, after the war this was quickly subsumed into a cultural realignment wherein RCAF culture came to mirror that of the USAF. The reasons for this cultural shift were summarised by Allan English:

Before the Second World War, the RCAF imitated its British counterpart in doctrine, ranks, and uniforms. By the Second World War, the “Canadianization” of overseas squadrons demanded by the public resulted in a gradual shift toward a more Canadian character in the RCAF overseas. At home, the British Commonwealth Air Training Plan not only perpetuated a Canadian way of doing things among the majority of the RCAF [personnel] who remained on this side of the Atlantic, but it also exposed many British aircrew trainees to a Canadian culture very different from the culture they had come from in the United Kingdom. With the advent of the Cold War [sic] and its close association with the US Air Force in both NORAD and NATO, the RCAF (and later Canadian air force) came under the strong cultural influence of its neighbour to the south.³⁴

Despite this cultural shift, the strong oral tradition that had already developed within the RCAF by the close of the Second World War was perpetuated by several trends that occurred during the cold war.

The first of these trends was the RCAF’s continued adoption of RAF and USAF tactical

and operational doctrine (subject to its existence). In addition to constituting a disincentive to the development of an independent body of theory and doctrine within the Canadian Air Force, this practice arguably served to narrow the focus of many officers to operational and tactical issues, to the detriment of strategic thinking. As a result, the development of Canadian Air Force institutional strategy during the cold war was not driven by, or related to, a strong theoretical framework. Instead, it appears that the primary strategic focus of the Air Force was achieving operational and tactical interoperability with the USAF in the context of the North American Aerospace Defense Command (NORAD) and with European allies in the context of the North Atlantic Treaty

Organization (NATO).³⁵ The lack of development of a theoretical framework to guide Canadian Air Force strategy was further compounded by the nature of the few RAF and USAF strategic publications available, almost all of which were not applicable to the Canadian Air Force since they related to the deployment of nuclear weapons

that the Canadian Air Force did not possess.

Perhaps more detrimental, however, was the effect of the unification of the Canadian Forces (CF) in 1968. As discussed above, Western air forces had long been concerned about the possibility of being reabsorbed into armies and navies. For the RCAF, unification effectively had the same result; the fact that the RCAF was divided among the unified CF’s newly established “commands,” rather than between the army and navy, was merely a detail.³⁶

Initially, the post-unification structure of the CF did not include an organisation exclusively responsible for applying air power because the former RCAF units were divided, in accordance with their primary function, among the CF’s six new “commands.” Maritime Command, for example, was assigned the former RCAF

... “the apparent failure of strategic bombing to meet its supporters’ claims damaged the credibility of air power generally.”²⁷

anti-submarine and other maritime-based assets, Mobile Command the CAS assets and Air Transport Command the strategic and some tactical lift assets.³⁷ Although the period of such stark division was short-lived (the amalgamation of Air Defence and Air Transport Commands into Air Command in 1975, accompanied by the subsequent amalgamation of all other Canadian air assets into this new command, regardless of their primary function, provided a common foundation upon which an air force culture could be rebuilt),³⁸ it nonetheless had ongoing ramifications for doctrine development. One of these ramifications was the exacerbation of the existing focus on operational and (especially) tactical issues. Another was to heighten the prominence of capability-based “communities” within the Canadian Air Force.

In this context, the term “communities” refers to the different capability components that constitute an air force, or more accurately, to the attitudes of the individuals within their communities. Just as armies have corps and regiments and navies have different classes of ships to perform different roles, so too are air forces comprised of different components, each charged with performing a different primary role. Examples of air force communities based on these components include the personnel primarily involved with the flight and maintenance of “fast-jets” (mostly fighter aircraft), surveillance aircraft, helicopters, tactical (or battlefield) and strategic transport aircraft and so on. Furthermore, other communities exist that overlap these component-based groupings. These additional communities may be based on occupation (such as maintenance personnel, logisticians and pilots) or on the type of service an individual renders (such as Reserve or Regular service).³⁹ Although these divisions exist in most air forces, in Canada unification had the effect of increasing the significance of the division between the air force’s capability-based communities.

As will be discussed in more detail in the second part of this article, the heightened division between the Canadian Air Force’s communities proved to be an additional impediment

to the production of sound doctrine by the Canadian Air Force. This was for two reasons, the first being the natural inclination of each community to focus on the pragmatic and tactical elements of its role, to the detriment of broader strategic and theoretical thinking. The second was that the prominence of the Air Force’s communities generated and perpetuated a culture of “stovepiping.” (In general, stovepiping is defined as “the condition that exists when staff or support personnel forget that they are subordinate to a line commander,” instead following instructions from higher up within the staff or support branch hierarchy.⁴⁰ In the case of the Canadian Air Force, its stovepipes were divided along similar lines to its various capability-based community groups, with loyalties being directed upwards within each community.)⁴¹

Conclusion

By the end of the cold war, Canadian Air Force culture had long been characterised by a strong oral tradition, wherein ideas were verbally disseminated between officers. In addition to inhibiting professional writing by air force personnel (with the possible exception of those attending staff college), this aspect of Canadian Air Force culture was accompanied by a tendency to pragmatically focus on contemporary issues rather than the development of broader theories and doctrines.

The roots of this aspect of Canadian Air Force culture lay in the early history of the theoretical development of air power. In particular, the intense criticism early air power theorists had attracted during the interwar period, and the early years of the Second World War served as a deterrent to many air force personnel, who became strongly reluctant to commit their thoughts to paper. Furthermore, the existing propensity of Canadian Air Force personnel to eschew written theory and doctrine was compounded by several trends during the cold war. These included the Canadian Air Force’s adoption of RAF and USAF doctrine manuals in lieu of domestic doctrine development as well as the ramifications of the CF’s unification in 1968.

Despite this aspect of its culture, there was still a minority within the Canadian Air Force who were willing to experiment with doctrine development. Following the formation of Air Command in 1975, momentum behind

doctrine development gradually grew within the Air Force. The history of this development, and how it has interacted with the Air Force's doctrinally adverse culture, will be the subject of the second part of this article. ■

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

Aaron P. Jackson holds a Bachelor of Business Economics and Government and a Bachelor of International Studies (Honours) from The Flinders University of South Australia, where he is currently undertaking his PhD studies. In addition to his studies, Aaron has taught international relations topics at Flinders University and The University of South Australia, and his work has previously been published in Australia, Canada and New Zealand. Having enlisted in January 2002, he is an active member of the Australian Army Reserve, a graduate of the Royal Military College of Australia and is currently posted to 10th/27th Battalion, The Royal South Australia Regiment.

List of Abbreviations

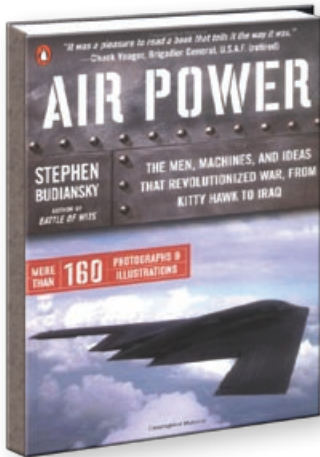
CAS	close air support	RAF	Royal Air Force
CF	Canadian Forces	RCAF	Royal Canadian Air Force
NATO	North Atlantic Treaty Organization	USAF	United States Air Force
NORAD	North American Aerospace Defense Command	US	United States

Notes

1. Paul Johnston, "Canopy Glint: Reflections on *Out of the Sun: Aerospace Doctrine for the Canadian Forces*," in *Air Force Command and Control*, ed. Douglas L. Erlandson and Allan English (Winnipeg, MB: Canadian Forces Training Material Production Centre, 2002), 83.
2. John Westrop (Chair), *Aerospace Doctrine Study: Final Report* (Ottawa: Canadian Air Force, 30 April 2002), iv.
3. Robert Futrell, *Ideas, Concepts, Doctrine, Volume 1: Basic Thinking in the United States Air Force, 1907–1960* (Maxwell Air Force Base: Air University, 1989), 2–3.
4. *Canadian Forces Aerospace Warfare Centre Concept of Operations (Final)* (n.p., Canadian Air Force, 7 June 2005).
5. Canada, Air Force, *B-GA-400-000/FP-000 Canadian Forces Aerospace Doctrine* (Trenton, ON: Canadian Forces Aerospace Warfare Centre, 2007). Available online at http://www.airforce.forces.gc.ca/cfawc/cdd/Publications/B-GA-400-000-FP-000_e.asp (accessed May 8, 2009).
6. Brian Holden-Reid, *A Doctrinal Perspective 1988–98*, The Occasional No. 33 (United Kingdom: Strategic and Combat Studies Institute, May 1998), 13.
7. Ibid.
8. Carl von Clausewitz, *On War*, ed. and trans. by Michael Howard and Peter Paret (Princeton: Princeton University Press, 1976), 578. Originally published in 1832.
9. Samuel P. Huntington, *The Soldier and the State: The Theory and Politics of Civil-Military Relations* (Cambridge MA: Harvard University Press, 1957), vii.
10. Colonel Charles G. Williamson (writing in 1943). Quoted in Futrell, *Ideas, Concepts, Doctrine, Volume 1*, 1–2.
11. 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), 22.
12. "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.
13. Discussion of this history begins with the First World War. Although there were several experiments and incidents of the use of the air for military purposes prior to this war, these were limited in scope, effect and vision, and the evolution of air warfare and of air power theory cannot be considered to have taken on its "modern" form until after the outbreak of the First World War. For a history of pre-First World War air power, see Basil Collier, *A History of Air Power* (London: Weidenfeld & Nicolson, 1974), 1–82.
14. Tami Biddle, "Learning in Real Time: The Development and Implementation of Air Power in the First World War," in *Air Power History: Turning Points from Kitty Hawk to Kosovo*, eds. Sebastian Cox and Peter Gray (London: Frank Cass, 2002), 6.
15. Ibid., 4.

16. Giulio Douhet, *The Command of the Air* (Arno Press: New York, 1972), 24. Originally published 1921.
17. *Ibid.*, 28.
18. *Ibid.*
19. *Ibid.*, 35.
20. David McIsaac, "Voices from the Central Blue: The Air Power Theorists," in *Makers of Modern Strategy: From Machiavelli to the Nuclear Age*, ed. Peter Paret (Princeton: Princeton University Press, 1986), 630–1.
21. David E. Omissi, *Air Power and Colonial Control: The Royal Air Force 1919–1939* (Manchester: Manchester University Press, 1990); and Timothy Garden, "Air Power: Theory and Practice," in *Strategy in the Contemporary World: An Introduction to Strategic Studies*, eds. John Baylis, James Wirtz, Eliot Cohen and Colin S. Gray (Oxford: Oxford University Press, 2002), 142–3.
22. Mader, *In Pursuit of Conceptual Excellence*, 106.
23. Although it operated as an autonomous force during the Second World War, the US Air Force was not officially separated from the US Army until September 18, 1947. David A. Anderton, *The History of the US Air Force* (London: Hamlyn-Aerospace, 1981), 134.
24. Brereton Greenhous and Hugh A. Halliday, *Canada's Air Forces 1914–1999* (Montreal: Art Global, 1999), 41.
25. A good example of this is Douhet's concept of the "battleplane." Douhet, *Command of the Air*, 117–120. For further examples, see McIsaac, "Voices from the Central Blue," 634–5.
26. Alan Stephens, *Power Plus Attitude: Ideas, Strategy and Doctrine in the Royal Australian Air Force 1921–1991* (Canberra: RAAF Air Power Studies Centre, 1992), 5–9.
27. *Ibid.*, 8–9.
28. Air supremacy exists where enemy air power cannot present a threat to one's own forces or territory. Ian McFarling, *Air Power Terminology*, 2nd ed. (Canberra: The Aerospace Centre, 2001), 10.
29. Richard P. Hallion, "The Second World War as a Turning Point in Air Power," in *Air Power History: Turning Points from Kitty Hawk to Kosovo*, eds. Sebastian Cox and Peter Gray (London: Frank Cass, 2002), 93–124.
30. Mader, *In Pursuit of Conceptual Excellence*, 108.
31. There was, of course, much debate about the potential role of nuclear weapons during this period, with much of it related to notions of strategic bombardment. However, participation in the written aspect of the debate by members of Western air forces was sparse. Lawrence Freedman, "The First Two Generations of Nuclear Strategists," in *Makers of Modern Strategy: From Machiavelli to the Nuclear Age*, ed. Peter Paret (Princeton: Princeton University Press, 1986), 735–78, esp. 736–7.
32. 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) examines the role of the theoretical development of air power and its relationship to the USAF and concludes that the USAF's abandonment of air power theoretical development during the decades following the Second World War led to many of the institutional problems it encountered during the 1980s and early 1990s. Mader, *In Pursuit of Conceptual Excellence*, 111–2, highlights the factors that led to the stagnation of air power theoretical and doctrinal development within the RAF during the cold war. In the case of the Canadian Air Force, a comprehensive study of the role air power theory played during its early history is yet to be undertaken. Allan D. English, *Understanding Military Culture: A Canadian Perspective* (Montreal: McGill-Queens University Press, 2004) esp. 93–5 examines the culture of the RCAF during this period, emphasising its close alignment with that of the USAF. This alignment, combined with the lack of available Canadian material from this period that addresses air power theory, suggests a high likelihood that the RCAF experience was similar to that of its larger allies.
33. For an overview of the RAF's interwar doctrine development, see William March, "Different Shades of Blue: Interwar Air Power Doctrine Development; Part 1: Air Power, Doctrine and the Anglo-American Approach," *The Canadian Air Force Journal* 2, no. 1 (Winter 2009), 20–23. Available online at http://www.airforce.forces.gc.ca/CFAWC/eLibrary/Journal/Vol2-2009/Iss1-Winter_e.asp (accessed May 8, 2009).
34. English, *Understanding Military Culture*, 95.
35. On NORAD and NATO, see Danford W. Middlemiss and Denis Stairs, "The Canadian Forces and the Doctrine of Interoperability: The Issues," in *The Canadian Forces and Interoperability: Panacea or Perdition?*, ed. Ann L. Griffiths (Halifax: Centre for Foreign Policy Studies, Dalhousie University, 2002), esp. 15–7; Joseph Jockel, "NORAD: Interoperability at 'The Zenith,'" in *The Canadian Forces and Interoperability: Panacea or Perdition?*, 126–34; and Public Diplomacy Division, *NATO Handbook* (Brussels: NATO, 2006), 15–29.
36. Since the Mulroney Government reintroduced a limited form of separation of the services in the mid-1980s, there has been little evidence that the Canadian Air Force has continued to be wary about the potential division of its assets into the other CF commands and today this concern does not seem to be as prominent as one might suspect. Quoting Douglas Bland, Allan English offered a possible explanation for the Canadian Air Force's recent nonchalance in this regard: "Bland tells us that 'few senior officers would be so bold as to advocate the dismantling of a rival service, at least overtly,' because they understand that 'appearing to share scarce resources protects them from criticism.'" English, *Understanding Military Culture*, 105.
37. Desmond Morton, *A Military History of Canada: From Champlain to Kosovo*, 4th ed. (Toronto: McClelland & Stewart, 1999), 251.
38. *Ibid.*, 261.
39. Allan English and John Westrup, *Canadian Air Force Leadership and Command: The Human Dimension of Expeditionary Air Force Operations* (Trenton, ON: Canadian Forces Aerospace Warfare Centre, 2007), 156–227. Available online at http://www.airforce.forces.gc.ca/cfawc/eLibrary/eLibrary_e.asp (accessed May 11, 2009).
40. Richard Szafranski, "Desert Storm Lessons from the Rear," *Parameters* 21, no. 4 (Winter 1991–2), 45; and Builder, *The Icarus Syndrome*, xiii–xix.
41. English and Westrup, *Canadian Air Force Leadership and Command*, 156–8.

BOOK REVIEWS



AIR POWER: THE MEN, MACHINES AND IDEAS THAT REVOLUTIONIZED WAR, FROM KITTY HAWK TO IRAQ

BY STEPHEN BUDIANSKY

NEW YORK:
PENGUIN BOOKS, 2004
518 PAGES ISBN 014303474X

Review by
Major Andrew B. Godefroy, CD, PhD

Despite the constant increasing utility of Wikipedia and other online searchable databases, every library requires a number of basic references to “bookend” its more detailed and perhaps obscure works. For students and scholars of air power, these likely include classic works by Boelcke, Trenchard, Douhet, Mitchell, Sikorsky, Slemon and even Boyd. Stephen Budiansky’s *Air Power*, a work that does not offer any new theories, attempts to deliver a concise overview of the evolution of air power from its earliest days to the present.

Attempting to cover a topic as broad as air power in a single volume is no small task, and accordingly, Budiansky is forced to hit the highlights while ignoring the less obvious or less well-known. The book is divided into four parts and addresses a wide range of topics, from strategic bombing to dogfighting and from naval aviation to precision munitions. Though slightly informative, the reader is too often told what is important but not why or what effect these developments had on the next stage of air power evolution. As well, one is quickly given the impression that only ideas related to tactics, targeting or technology truly drove air power evolution, and the book too often misses the importance of many other factors. Experimental test flight as well as sub-orbital and space

operations, to name but a few, barely receive mention or consideration.

The book falls into the typical trap formula of technology plus tactics equals air power. It makes no effort whatsoever to address the role of air forces across the entire spectrum of conflict, whether as a force of surveillance, coercion or even humanitarian intervention and relief. Though Budiansky obviously recognizes air forces as instruments of sovereignty and national will, he appears uninterested in exploring these subjects any further here. Thus, Budiansky’s vision of air power is quickly dumbed down into a discussion of targeting.

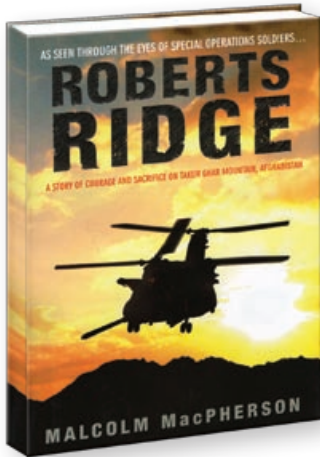
As with too many books in this genre, *Air Power* is predictably Anglo-American-centric, paying tiny courtesies to German, French and Italian thinkers while simply ignoring pretty much everyone else. While Middle-Eastern engagements such as the Bekaa Valley are emphasized, the author, for example, avoids the 1965/1970 Indo-Pakistan air wars, the Iran-Iraq tanker war of the 1980s and, rather surprisingly, even the 1982 Falkland Islands naval air war. As well, three-quarters of *Air Power* is devoted to the pre-1945 era, a period already well covered in many other books, giving only a small portion of the volume to

consider all the developments from 1945 to 2003. Given the dramatic advances of aerospace operations and technologies since the end of World War II, one would expect a new book to spend less time on older topics and give more attention to the jet age.

Readers looking for a basic reference should give *Air Power* a pass. As good as it claims to be, it is not really a book about air power as much a book about what was important to the development of United States Air Force air

tactics. Yet even here Budiansky's munitions fall well short of the target, and readers may want to look elsewhere for that handy desk reference. ■

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*.



ROBERTS RIDGE:

A STORY OF COURAGE AND SACRIFICE ON TAKUR GHAR MOUNTAIN, AFGHANISTAN

BY MALCOLM MACPHERSON

NEW YORK:
 DELACORTE PRESS, 2005
 338 PAGES ISBN 0-553-80363-8

Review by
 Major William March, CD, MA

As my focus at work or interests change, I have a tendency to reread books in order to obtain a different perspective or to attempt to glean some additional knowledge about a particular subject. I first read *Roberts Ridge* a few years ago out of general interest, given Canada's involvement in Afghanistan. The book tells the story of a United States (US) special operations mission that went horribly wrong. What started out as a "routine," albeit hazardous, mission in support of a larger military campaign quickly developed a life of its own when the Chinook helicopter

tasked to deliver a special operations team to the top of Takur Ghar Mountain came under fire. In the subsequent confusion, Petty Officer 1st Class Neil C. Roberts—a navy Sea, Air, Land (SEAL) specialist—was thrown from the aircraft and subsequently died at the hands of the entrenched Taliban/al-Qaeda forces. *Roberts Ridge*, titled in his honour, is the account of the attempt to retrieve Petty Officer Roberts—first by his original team and then by a quick reaction force consisting primarily of US Army Rangers—and the ensuing fight at altitudes in excess of 10,000 feet.

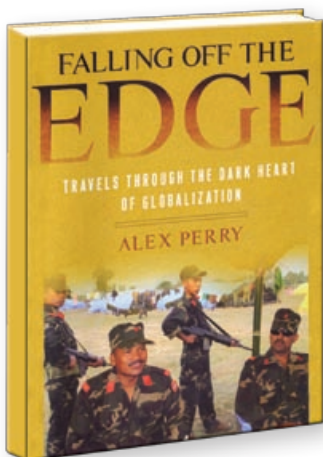
At that time I found this book to be a gripping account of combat on a remote Afghanistan mountain top, under extreme environmental conditions and in the face of a determined enemy. The author, a journalist by trade, conducted meticulous research using open sources and interviews. His writing style is such that it brings the human element very much to the fore, and the reader quickly becomes emotionally engaged in the survival, or death, of the participants. In short, it was a “good read.”

Fast forward two years or so, and now the Canadian Air Force is operating Chinooks in Afghanistan. Suddenly, *Roberts Ridge* had new meaning and could be reread from a different point of view. The original insertion by Chinook of the special operations team was attempted in the face of a well-positioned enemy force—why? Was it a failure in intelligence, bad luck or a combination of both? There was a lack of a dedicated escort and hesitation in the use of suppressing fire prior to inserting the team at the landing zone—why? Was this standard procedure to increase the element of surprise, miscommunication, an underestimation of the enemy or a combination of many factors? The subsequent attempt at a “rescue” by US Army Rangers resulted in an under-strength unit being delivered by Chinook to the very same “hot” landing zone with predictable results. How did this happen? The ensuing firefight between the Rangers and their opponents took place at extremely close quarters—so close that the provision of close air support (CAS) using standard weapon loads (500- and 1000-pound bombs) could be as hazardous to the “friendlyes”

as it would be to the “hostiles.” Indeed, the author makes the point that when it became known that a Predator unmanned aerial vehicle (UAV), equipped with Hellfire missiles (each with a smaller warhead) was available, there was little hesitation in tasking it to provide the much needed CAS because the potential for collateral damage was much less. Finally, the very nature of aerial operations in mountainous terrain and the need for aircrew (indeed, all combat forces) to be equipped, trained and motivated to, if necessary, fight and evade in this type of environment was a definite factor in the book. Not only did the author indicate that the Rangers were inadequately prepared to deal with the altitude and weather—so too were the aircrew.

Roberts Ridge is not an in-depth analysis of a military operation; it is an account of soldiers, sailors and air force personnel fighting for survival under extreme conditions. However, it does offer glimpses into the conduct of tactical helicopter operations that the Canadians in Afghanistan either are conducting or may be called on to undertake in the future. Therefore, it provides food for thought, and I highly recommend that it be given a “first” read. Or, if you are like me, a “second” read from a new perspective. ■

Major William March, a maritime Airborne Combat Systems Operator, 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.



FALLING OFF THE EDGE:

TRAVELS THROUGH THE DARK HEART OF GLOBALIZATION

BY ALEX PERRY

NEW YORK:
BLOOMSBURY PRESS, 2008
342 PAGES
ISBN-13 978-1-59691-526-8 ISBN-10 1-59691-526-9

Review by
Captain François Dufault, CD

Modern prophets describe globalization as a means of flattening the earth.¹ Alex Perry pushes the analogy further by stating that the problem with a flat earth is that people start falling off the edge. Alex Perry is *Time's* Africa bureau chief and is based in Cape Town. From 2002 to 2006, he was the South Asia bureau chief and was based in New Delhi. He is a reporter who has worked and continues to work on the “front lines” of today’s conflicts, mostly in developing countries. Throughout his assignments in Asia, Africa and the Middle East, he came to the realization that these local conflicts are rooted deeply in globalization.

His background and experience certainly bring credibility to the book. In his own words, it is a “reporter’s book”² that views the impacts of globalization from the front lines. This book is the result of Perry’s slow realization that in his post-9/11 experience as a reporter, he regularly found himself in some of the world’s hotspots and often was the only Western reporter there. Perry noted that the people developing the ideas and concepts that are forging globalization and global free markets are mostly located in New York, London and other big cities; they rarely travel to the locations where these policies have the biggest effects on people’s daily lives and, therefore, do not see their policies’ impacts.

Perry uses first-hand accounts to show the readers these impacts. He dedicates a whole chapter on Shenzhen—a Chinese city on Hong Kong’s border—and its sweat shops. This is followed by a good chapter on Mumbai and the vast and growing gap between rich and poor in today’s India. In the rest of the book, Perry jumps around Africa and Asia from Nigeria to Nepal to Kenya (where he got arrested for reporting without a permit). Also, he returns frequently to India and China. In fact, in these chapters he is quite hard to follow since he very frequently changes location between paragraphs, without warning the reader.

The book’s main conclusion is that the world is now entering a new era of war and that globalization is to blame. The rich are getting richer, and the poor poorer. One good example Alex Perry provides is the global standardization of television. Remote villagers—who just a decade ago had to walk several miles to get to the next village—now have televisions, can watch *Friends* and see what they are missing out on.³ This is the type of globalizing effect that is brewing trouble in the developing world.

Perry tends to generalize the effects of globalization to the extreme. In doing so, he blames globalization for all the terrorist acts across the globe. In his view, terrorism is a subset of the anti-globalization movement.

If globalization is “standardizing” the world, then anti-globalization is resistance to that trend and terrorism is a means to accomplish it. This is, in his opinion, the reason al-Qaeda crashed two airplanes into the World Trade Center.⁴ The weakness in Perry’s argument comes from this generalization. By stating that pirates operating in the Straits of Singapore are in fact attacking globalization,⁵ he includes piracy, which has been around ever since man has traveled by sea, in the relatively recent anti-globalization movement. The counter argument is that some terrorist acts, such as piracy, are perpetrated by crooks and criminals who are motivated by easy money and greed and have little interest in globalization.

If we were to extrapolate Perry’s argument, Canada’s contribution in Afghanistan is more about fostering globalization than supporting a local democratic government. His argument has some validity, but the reasoning is somewhat simplistic. One could argue that Canada, as part of a greater NATO involvement in Afghanistan, is a means to help a developing democratic nation to benefit from globalization, effectively preventing it from “falling off the edge.”

This book provides the reader with the “other side’s” view of today’s conflicts and the impacts of globalization. It will be of particular interest to the members of the Canadian Air Force or the Canadian Forces as we are likely

to be called upon to intervene in some of these hot spots, where globalization might be a causal factor of the conflict. However, it should, in my opinion, be balanced with further readings in order to take into account the different points of view. ■

Captain François Dufault is a Griffon pilot who currently works in the Directorate of Aerospace Requirements 9 (Tactical Aviation) within the Air Staff in Ottawa. He is a graduate of the Royal Military College of Canada in Civil Engineering and is currently pursuing a Master’s of Engineering Management at the University of Ottawa, as a part-time student.

Notes

1. Alex Perry credits *New York Times* columnist Thomas Friedman with coining the metaphor “flattening the earth” in: Alex Perry, *Falling off the Edge: Travels Through the Dark Heart of Globalization* (New York: Bloomsbury Press, 2008), 19.

2. *Ibid.*, 17.

3. *Ibid.*, 28.

4. In Perry’s opinion, al-Qaeda is an “interesting paradox” in that its actions are those of an anti-globalizer: “striking a more powerful foe in a guerrilla war, railing against the dominant Western way of life.” However its real intent is one of globalizer: “to impose a vast Muslim caliphate on the world.” *Ibid.*, 309.

5. *Ibid.*, 106–7.