

The Canadian Corps in the Great War: A Learning Organization in Action

A Monograph

by

MAJ David G. Fearon
Canadian Army



School of Advanced Military Studies
United States Army Command and General Staff College
Fort Leavenworth, Kansas

2016

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing this collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. **PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.**

1. REPORT DATE (DD-MM-YYYY) 04/04/2016		2. REPORT TYPE SAMS Monograph		3. DATES COVERED (From - To) July 2015 – May 2016	
4. TITLE AND SUBTITLE The Canadian Corps in the Great War: A Learning Organization in Action.				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S) Maj David G. Fearon Canadian Army				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) School of Advanced Military Studies (SAMS) 201 Reynolds Avenue Fort Leavenworth, KS 66027-2134				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) Command and General Staff College 731 McClellan Avenue Fort Leavenworth, KS 66027-1350				10. SPONSOR/MONITOR'S ACRONYM(S) CGSC	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION / AVAILABILITY STATEMENT Approved for Public Release; Distribution Unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT On August 4, 1914 Canada found itself at war. As a Dominion within the British Empire, Canada had nearly complete control of its domestic affairs but London still controlled its foreign policy. With only a small permanent force of 3,000 men, Canada found itself unprepared for war. By 1916, Canada's Army had grown to an infantry corps of four divisions. The Canadian Corps accomplished a remarkable process of maturation considering its unimpressive beginnings and the effect of its high casualty rate throughout the conflict. Analysis of the Canadian Corps revealed that the Corps' excellent performance during the war – especially in the later years – resulted from its transformation into a learning organization. Just as the referenced learning organization theories describe, the Corps learned and improved over time by engaging in a process of acquiring or creating, interpreting, transferring, and retaining information. Supported by an organizational culture that encouraged and accepted change within the organization, the Canadian Corps possessed the traits of a learning organization, and demonstrated the expected behaviors of such an organization in its combat performance.					
15. SUBJECT TERMS Canadian Army, Canadian Corps, Learning Organization, World War I					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT Unclassified	b. ABSTRACT Unclassified	c. THIS PAGE Unclassified			19b. TELEPHONE NUMBER (include area code) 913-758-3302

Monograph Approval Page

Name of Candidate: MAJ David G. Fearon

Monograph Title: The Canadian Corps in the Great War: A Learning Organization in Action.

Approved by:

_____, Monograph Director
Mark T. Calhoun, PhD

_____, Seminar Leader
James W. Wright, COL

_____, Director, School of Advanced Military Studies
Henry A. Arnold III, COL

Accepted this 26th day of May 2016 by:

_____, Director, Graduate Degree Programs
Robert F. Baumann, PhD

The opinions and conclusions expressed herein are those of the student author and do not necessarily represent the views of the U.S. Army Command and General Staff College or any other government agency. (References to this study should include the foregoing statement.)

Fair use determination or copyright permission has been obtained for the inclusion of pictures, maps, graphics, and any other works incorporated into this manuscript. A work of the United States Government is not subject to copyright, however further publication or sale of copyrighted images is not permissible.

Abstract

The Canadian Corps in the Great War: A Learning Organization in Action, by Major David G. Fearon, Canadian Army, 80 pages.

On August 4, 1914 Canada found itself at war. As a Dominion within the British Empire, Canada had nearly complete control of its domestic affairs but London still controlled its foreign policy. With only a small permanent force of 3,000 men, Canada found itself unprepared for war. By 1916, Canada's Army had grown to an infantry corps of four divisions. The Canadian Corps accomplished a remarkable process of maturation considering its unimpressive beginnings and the effect of its high casualty rate throughout the conflict. Analysis of the Canadian Corps revealed that the Corps' excellent performance during the war—particularly in the later years—resulted from its transformation into a learning organization. Just as the referenced learning organization theories describe, the Corps learned and improved over time by engaging in a process of acquiring or creating, interpreting, transferring, and retaining information. Supported by an organizational culture that encouraged and accepted change within the organization, the Canadian Corps possessed the traits of a learning organization, and demonstrated the expected behaviors of such an organization in its combat performance.

Contents

Acknowledgments	v
Introduction	1
Fundamentals of a learning organization	3
How Institutions Learn.....	6
Organizational Culture.....	8
Militaries as learning organizations	9
The Canadian Experience August 1914 – November 1916.....	15
The First Division	15
Second Ypres	19
Festubert.....	22
The Crucible – The Somme, 1916	26
Analysis.....	32
The Canadian Experience November 1916 – November 1918.	35
Professionalizing the Corps	35
Vimy Ridge	44
Hill 70 and Passchendaele.....	47
The Hundred Days	57
Analysis.....	72
Cross Case Analysis: The Canadian Corps as a Learning Organization.....	74
Conclusion and Implications	75
Bibliography	77

Acknowledgments

I would like to thank Dr. Mark T. Calhoun for his remarkable guidance, mentorship, and patience throughout the course of this project. Additionally, Colonel Whit Wright for his leadership and professionalism throughout this past academic year and my mates from Seminar nine for their camaraderie. Most importantly, I must thank my wife Lauralee and my children Norah and Isaac for their enduring support and inspiration. This monograph would not be possible without them.

Introduction

With Great Britain's declaration of war against the Central Powers on August 4, 1914, Canada found itself at war. As a Dominion within the British Empire, Canada had nearly complete control of its domestic affairs but London still controlled its foreign policy. Canadian Prime Minister Sir Wilfred Laurier succinctly captured this relationship in 1910, "When Britain is at war, Canada is at war. There is no distinction."¹ With only a small permanent force of 3,000 men, Canada found itself woefully unprepared for war. Canada did however possess an extensive militia system providing it with a military presence in nearly every town. Chronically undermanned and equipped most militia units acted more as social rather than military organizations. Militia units paraded a few times a year including a week or two of collective training each summer. Despite its limited military effectiveness, the militia system provided a framework within which to mobilize. The British Government immediately accepted Canada's offer of an infantry division as thousands of young men flocked to their local militia unit. Driven by patriotic fervor and the quest for adventure, the 1st Division of the Canadian Expeditionary Force sailed for Great Britain in October 1914. After a period of additional training in Great Britain, the 1st Canadian Division entered the line in March 1915.

The arrival of the 2nd Division in September 1915 resulted in the establishment of the Canadian Corps. The term "Canadian Expeditionary Corps" evolved to encompass all Canadian units overseas, including an independent cavalry brigade and numerous supply and training depots, but the Canadian Corps made up the main combat element. The Corps' seizure of Vimy Ridge in April 1917 marked a clear milestone in its maturation process. The period prior to Vimy Ridge saw the slow but steady evolution of tactics, training, and organization within the Canadian

¹ Desmond Morton, *A Military History of Canada: From Champlain to Kosovo* (Toronto: McClelland and Stewart, 1999), 130.

Corps. Stymied by the defensive superiority of trench warfare the Canadian Corps searched for practical and sustainable methods with which to break the deadlock. Throughout the pre-Vimy period, the Canadian Corps grew rapidly into an effective organization of four large divisions while simultaneously conducting combat operations on the Western Front. The application of lessons learned during the battles of 1915 and 1916 contributed directly to the Corps' success at Vimy Ridge. However, Vimy Ridge did not mark the end of the Corps' maturation process—it continued to learn and adapt. The Corps soon earned a reputation as one of the most effective and innovative Corps in the British Army. Selected as one of the lead formations in what became the final campaign of the war, the Hundred Days, the British High Command acknowledged the Canadian Corps as a highly effective and reliable organization. The Canadian Corps accomplished a remarkable process of maturation considering its unimpressive beginnings and the effect of its high casualty rate throughout the conflict.²

Determining how the Canadian Corps grew into this impressive organization provides valuable insight regarding the ways in which militaries adapt to their operating environment. Changing methods in the midst of war is a difficult endeavor. Williamson Murray differentiates between innovation and adaptation by defining the former as occurring in peacetime and the latter in war. Murray therefore argues that the processes of innovation and adaptation are similar, but

² For the official histories of the Canadian Expeditionary Force see A. F. Duguid, *Official History of the Canadian Forces in the Great War, 1914-1919* (Ottawa: King's Printer, 1938) and G. W. L. Nicholson, *The Official History of the Canadian Army: Canadian Expeditionary Force, 1914-1919* (Ottawa: Queen's Printer, 1962); Tim Cook, *At the Sharp End: Canadians Fighting the Great War 1914-1916* (Toronto: Penguin, 2007) and *Shock Troops: Canadians Fighting the Great War 1917-1918* (Toronto: Penguin, 2008) is an extremely detailed account of the Canadian contribution to the Great War. Bill Rawling, *Surviving Trench Warfare: Technology and the Canadian Corps, 1914-1918* (Toronto: University of Toronto Press, 1992) outlines the Canadian Corps adoption of technology throughout the war. Shane B. Schreiber, *Shock Army of the British Empire: The Canadian Corps in the Last 100 Days of the Great War* (Westport, CT: Greenwood Publishing, 1997) provides a detailed account of the Corps' key role in the final offensive of the war.

the environments in which they occur are markedly different. Innovation lacks the pressures that affect adaptation, which must occur rapidly and effectively since failure often results in defeat. In contrast, innovation can afford to be slower, allowing for cautious debate, study, and implementation of the process. Adaptation presents no such opportunities and, further, suffers from pre-war biases. As Murray put it, “Most military organizations and their leaders attempt to impose prewar conceptions on the war they are fighting, rather than adapt their assumptions to reality. In this case they adapt only after great losses in men and national treasure.”³ In the case of the Canadian Corps, adaptation cost over 230,000 dead and wounded.⁴

Learning organization theory provides a method to illustrate how the Canadian Corps dealt with the challenges it faced to rise to the immense challenges of the WWI battlefield and perform effectively in one of history’s most brutal wars. Official histories, unit war diaries, and key leader correspondence serve as evidence to enable examination of the development of the Canadian Corps as an effective organization with a view to identifying whether the Corps exhibited the characteristics identified in the literature of learning organizations. Analyzing the Corps’ combat performance through the lens of a learning organization demonstrated its usefulness as appropriate tool for analysis of the development of military organizations.

Fundamentals of a learning organization

Organizational behaviorists Robbins and Langton described an organization as a, “Consciously coordinated social unit, composed of a group of people that functions on a relatively continuous basis to achieve a common goal or set of goals.”⁵ Corporations, sports

³ Williamson Murray, *Military Adaptation in War: With Fear of Change* (New York: Cambridge University Press, 2011), 6.

⁴ Tim Cook, *Shock Troops: Canadians Fighting the Great War, 1917-1918* (Toronto: Penguin, 2008), 614.

⁵ Stephen P. Robbins and Nancy Langton, *Organizational Behaviour: Concepts,*

teams, unions, charities, and criminal gangs represent just a few types of organizations.

Organizations that fail to achieve their specified goal must either cease to exist, or adapt and survive. According to one school of organizational theory, the ability to learn determines which organizations survive and which do not. In the terminology of this theoretical school, those that survive do so because they develop the characteristics of a “learning organization.”⁶

Peter Senge popularized the concept of the learning organization in 1990 with the publication of his book *The Fifth Discipline: The Art and Practice of the Learning Organization*. Senge defines a learning organization as one “where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning how to learn together.”⁷ According to Senge, a learning organization displays five characteristics or disciplines: personal mastery, mental models, shared vision, team learning, and systems thinking. Personal mastery implies that organizational learning begins with each individual within the organization. For the organization to learn, its members must learn. Mental models encompass the organization’s understanding of its environment. Shared vision reflects the organization’s view of the future and its role within it. Team learning refers to groups of individuals working together to

Controversies, Applications (Toronto: Pearson Education, 2003), 5.

⁶ Learning organization theory generally places emphasis on either the cognitive or the behavior aspects of learning. David Kolb, *Experiential Learning: Experience as the source of learning and development* (Englewood Cliffs, NJ: Prentice Hall, 1984) presents an experiential learning theory that focuses on the cognitive aspects of learning. Peter Senge, *The Fifth Discipline: The Art and Practice of the Learning Organization* (New York: Doubleday, 2006) remains the most popular work on learning organization theory and takes a balanced approach between the cognitive and behavioral aspects of learning. David Garvin, *Learning in Action: A Guide to Putting the Learning Organization to Work* (Boston: Harvard Business School Press, 2000) encompasses assimilation theory and takes a more behavior-based approach to learning, a more appropriate model for organizations seeking to adapt vice innovate.

⁷ Peter Senge, *The Fifth Discipline: The Art and Practice of the Learning Organization* (New York: Doubleday, 2006), 3.

solve a problem. Lastly, a systems thinking approach serves to integrate the other four concepts together by contemplating how the organization as a whole interacts with its environment.⁸

David A. Garvin provides a more practical definition in his *Learning in Action: A Guide to Putting the Learning Organization to Work*. According to Garvin, “a learning organization is an organization skilled at creating, acquiring, interpreting, transferring, and retaining knowledge, and at purposefully modifying its behavior to reflect new knowledge and insights.”⁹ Garvin’s definition indicates that to be a true learning organization, the organization must change its behavior—specifically, the method by which it conducts its assigned purpose. Garvin’s focus on the behavior or action-based aspects of organizational learning makes his approach particularly applicable to organizations seeking adaptation vice innovation.

Inherent within Garvin’s concept of a learning organization is the idea that in order to change its behavior the organization must adopt four complementary processes. It must first acquire or create new ideas or methods to replace those deemed ineffective. These new ideas or methods are generated either within the organization or copied from other organizations. Whatever their source, the organization requires an influx of new ideas because, according to Garvin, “new ideas are essential if learning is to take place.” The second process involves interpreting the ideas generated by the first process; “An abundance of new knowledge does not ensure that a learning organization exists.” The organization must interpret new ideas and information and eliminate those that are unsuitable. Garvin’s third element involves the dissemination of information throughout the organization. Great ideas and valuable information are useless when compartmentalized and restricted. Rather, “New ideas must diffuse rapidly throughout the organization, extending from person to person, department to department, and

⁸ Peter Senge, *The Fifth Discipline*, 6-11.

⁹ David A. Garvin, *Learning in Action: A Guide to Putting the Learning Organization to Work* (Boston: Harvard Business School Press, 2000), 11.

division to division.” Finally, a learning organization retains information despite personnel turnover. Thus, information resides not within an individual but within the organization as a whole. It becomes part of the institutional memory of the organization, a critical factor in organizations such as the Canadian Corps with its constant high rate of casualties. Therefore, a learning organization acquires, interprets, transfers, and retains knowledge and directs those characteristics toward the goal of changing its behavior.¹⁰

How Institutions Learn

Whereas researchers such as Senge and Garvin defined learning organizations and described their basic characteristics, researchers Chris Argyris and Donald Schön explored the process by which organizational or institutional learning occurs. They argued that successful adaptation or change depends on the organization’s ability to learn. According to Argyris and Schön, organizational learning involves, “The detection and correction of error.”¹¹ They asserted that organizations learn through either single loop or double loop learning. Single loop learning, the simplest model, “involves learning from the consequences of previous actions in order to develop successful patterns of behavior.”¹² Argyris and Schön described single loop learning as a thermostat that “learns when it is too hot or too cold and turns the heat on or off. The thermostat can perform this task because it can receive information and take corrective action.”¹³ Organizations that utilize single loop learning can make the necessary adjustments to correct an

¹⁰ Garvin, *Learning in Action*, 11.

¹¹ Chris Argyris and Donald A. Schön, *Organizational Learning: A Theory of Action Perspective* (Reading MA: Addison-Wesley 1978), 2.

¹² Mary Jo Hatch and Ann L. Cunliffe, *Organization Theory: Modern, Symbolic, and Postmodern Perspectives*, 2nd ed. (New York: Oxford University Press, 2006), 316.

¹³ Argyris and Schön, *Organizational Learning*, 2.

error without questioning their current structure, methods, assumptions, or values. Often, single loop learning is simply the quest for efficiency

However, some challenges require solutions beyond the organization's current structure and methods and force the organization to question its assumptions and underlying values.

Organizations seeking to correct such errors must engage in double loop learning. Argyris and Schön state that, "Double-loop learning occurs when error is detected and corrected in ways that involve the modification of an organization's underlying norms, policies, and objectives."¹⁴ The advantage of double-loop learning is that it, "challenges deeply rooted assumptions and norms within an organization. In this way, it provides opportunities for radically different solutions to problems and dramatic jumps in improvements."¹⁵ Double-loop learning involves more creativity and exploration of new methods—hence, it involves more risk than single-loop learning with its reliance on established methods. Double-loop learning may not yield immediate results because it challenges an organization's underlying assumptions. As Argyris and Schön argued, "organizations tend to create learning systems that inhibit double-loop learning that calls into question their norms, objectives and basic policies."¹⁶ Therefore, an organization attempting to change its basic assumptions will often face significant internal resistance to change. How well the organization overcomes that resistance to engage in double loop learning depends on its organizational culture.

¹⁴ Argyris and Schön, *Organizational Learning*, 2.

¹⁵ Robbins and Langton, *Organizational Behaviour*, 447.

¹⁶ Argyris and Schön, *Organizational Learning*, 4.

Organizational Culture

Edgar Schein defined organizational culture as, “A pattern of shared basic assumptions that a group has learned as it solved its problems of external adaptation and internal integration that has worked well enough to be considered valid and therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems.”¹⁷ For Schein, an organization’s culture consists of its artifacts, beliefs, values, and assumptions, each of which plays an important role in bonding current members of the organization and integrating new members. All members of the organization share its culture and teach it to new members upon arrival. James Wilson provided a more direct definition of organizational culture, “a persistent, patterned way of thinking about the central tasks of and human relationships within an organization.”¹⁸ Organizational culture helps the institution to frame problems and the operating environment and influences how its members think and behave.¹⁹

Organizations with cultures that embrace change and are not limited by their artifacts, values, beliefs, or assumptions are better situated to pursue a double-loop learning strategy. Thus, when a learning organization detects an error, it engages in single or double loop learning as appropriate based on its organizational culture. This produces an institution that effectively creates, acquires, interprets, disseminates, and retains knowledge to change its performance and achieve its goal.

¹⁷ Edgar H. Schein, *Organizational Culture and Leadership*, 4th ed. (San Francisco: Jossey-Bass, 2010), 18.

¹⁸ James Q. Wilson, *Bureaucracy: What Government Agencies Do and Why They Do It*, (New York: Basic Books, 1989), 91.

¹⁹ Robbins and Langton, *Organizational Behaviour*, 333.

Militaries as learning organizations

While Senge and Garvin do not ignore military organizations in their research, they give scant attention to their unique characteristics. Despite the importance of learning to military organizations, most studies that apply learning organization theory in a military context rely on two authors. Richard Downie's *Learning from Conflict: The U.S. Military in Vietnam, El Salvador, and the Drug War* and John A. Nagl's *Learning to Eat Soup with a Knife: Counterinsurgency Lessons from Malaya and Vietnam*. Richard Downie studied the US Army as a learning organization specifically with regard to its development of low-intensity conflict doctrine in the post-Vietnam era. According to Downie, institutional learning in a military context occurs when, "An organization uses new knowledge or understanding gained from experience or study to adjust institutional norms, doctrine, and procedures in ways designed to minimize previous gaps in performance and maximize future success."²⁰ Thus, Downie found that like other organizations, militaries adopt a learning process similar to that described by Garvin.

Significantly, Downie included the term *doctrine* in his description. The key output of the institutional learning process for military organizations is new doctrine that addresses detected gaps in performance. The US Department of Defense defines doctrine as, "Fundamental principles by which the military forces or elements thereof guide their actions in support of national objectives. It is authoritative but requires judgment in application."²¹ In large military organizations, doctrine provides a common foundation for action. Doctrine, according to NATO's baseline publication Allied Joint Publication-01, *Allied Joint Doctrine*, "Captures that which is enduring in best practice whilst incorporating contemporary insights and how these principles are

²⁰ Downie, *Learning from Conflict: The U.S. Military in Vietnam, El Salvador, and the Drug War* (Westport, CT: Praeger, 1998), 22.

²¹ Army Doctrine Reference Publication (ADP) 1-02, *Operational Terms and Military Symbols* (Washington, DC: Government Printing Office, 2013), 1-20.

applied today and in the immediate future. It is dynamic and constantly reviewed for relevance.”²² Thus, changes in doctrine reflect the organization’s ability to learn new knowledge and to retain it as part of its institutional memory. The Great War experience of the Canadian Corps, operating on the casualty intensive Western Front, illustrates the importance of this learning process.

John A. Nagl’s *Learning to Eat Soup with a Knife* was a particularly influential study into militaries as learning organizations.²³ Nagl applied Downie’s framework of learning organization theory to a comparative study of British counterinsurgency experience in Malaya and the United States’ experience in Vietnam. Nagl found that “The varying strategic and organizational cultures of different organizations play a critical role in the organizations’ abilities to adapt their structure and functions to the demands placed upon them.”²⁴ Nagl asserted that the British Army in Malaya adopted the tenets of a learning organization and thus achieved its goals. However, he found that the United States military ultimately failed to achieve its goals in Vietnam partly due to its inability to act as a learning organization and successfully adapt to its environment. According to Nagl, “the organizational culture...played a key role in allowing an organization to create a consensus either in favor of or in opposition to proposals for change.”²⁵ Nagl’s research reiterated

²² Allied Joint Publication (AJP) 0-1, *Allied Joint Doctrine* (Assistant Chief of the Defence Staff, 2010), 1-1.

²³ Nagl’s book proved highly influential with the US military. While serving as Chief of Staff of the US Army, General Peter Schoomaker wrote the introduction to the book’s 2006 edition. Furthermore, of the several hundred theses written by students at the US Army Command and General Staff School and monographs written by students at the US Army’s School of Advanced Military Studies since the publication of his book, seventy-nine have referenced Nagl’s work.

²⁴ John A. Nagl, *Learning to Eat Soup with a Knife: Counterinsurgency lessons from Malaya and Vietnam* (Chicago: University of Chicago Press, 2005), 6.

²⁵ Nagl, *Learning to Eat Soup with a Knife*, 215.

the importance of organizational culture in facilitating adaptation by military organizations in combat.

Timothy Lupfer conducted a similar study of doctrinal change in his examination of the German Army in World War I. Lupfer found that the difficulties of trench warfare stymied the German Army just as it did the Allies, leading the German Army to engage in two distinct periods of doctrinal change. Lupfer found that the German Army's process of change closely resembled the tenets of a learning organization as described by Garvin. It acquired or created information then interpreted, disseminated and retained it in order to change its behavior. The first period of doctrinal change occurred after the Battle of Somme in 1916. Historical narratives of the Somme often understate the battle's effect on the German Army, focusing instead on the enormous casualties suffered by the British.²⁶ During the Battle of the Somme, German defensive doctrine centered on a linear defense and the stubborn refusal to yield any ground to the attacker. Highly vulnerable to Allied artillery fire, the German troops that occupied the front line trenches suffered enormous casualties throughout the battle. Beginning in the autumn of 1916 the German Army conducted a systematic reappraisal of its defensive doctrine. Lupfer identified nine elements within the German process of doctrinal change that echo the learning process described by Garvin as acquiring or creating, interpreting, transferring, and retaining knowledge and by Argyris and Schön as identifying error:

1. The perception of a need for change. (Identification of error)
2. Solicitation of ideas, especially from the field units. (Acquiring/creating knowledge)
3. Definition of the change. (Interpreting)
4. Dissemination of the change. (Transferring)

²⁶ See Jack Sheldon, *The German Army on the Somme 1914-1916* (Barnsley: Pen and Sword Books, 2007); William Philpott, *Three Armies on the Somme* (New York: Alfred Knopf, 2010).

5. Enforcement throughout the army. (Transferring and retaining)
6. Modification of organization and equipment to accommodate the change. (Interpreting)
7. Thorough training. (Transferring and retaining)
8. Evaluation of effectiveness. (Interpreting)
9. Subsequent refinement.²⁷ (Interpreting)

As the newly appointed Quartermaster of the German Army, General Erich Ludendorff led the process of doctrinal change. Given his dominance and influence throughout the army, one might assume that this resulted in a top-driven process. On the contrary, Ludendorff proved “extremely flexible and willing to change.”²⁸ The German High Command requested, interpreted, and evaluated suggestions from all levels of the German Army before disseminating and codifying new tactics into doctrine. Ludendorff, and by extension the entire chain of command, played a critical role in fostering new techniques that led to the adoption of the “elastic defense,” reflecting the importance of leadership in fostering change. Lupfer stressed that “A greater service can be rendered by the higher headquarters that earnestly solicits opinions and experiences from units in the field, evaluates and distills the information, and disseminates the findings back to the field units.”²⁹ The elastic defense focused on minimizing casualties from Allied artillery while preserving strong counterattack forces. The German Army quickly adopted the principles of the elastic defense. A British summary of German tactics published in January 1917, noted, “The experience of the Somme battle has taught the Germans the necessity of holding the first trench lightly and of distributing the bulk of the garrison of the First Line

²⁷ Timothy Lupfer, *The Dynamics of Doctrine: The Changes in German Tactical During the First World War*, Leavenworth Papers, no.4 (Fort Leavenworth, KS: Combat Studies Institute, 1981), viii.

²⁸ Timothy Lupfer, *Dynamics of Doctrine*, 9.

²⁹ Timothy Lupfer, *Dynamics of Doctrine*, 7.

Position in support and reserve as close as possible to the rear.”³⁰ This demonstrated the ability of the Germans to adapt to changing conditions on the Western Front and tested the Allies’ ability to respond in kind.

The second period of German doctrinal change centered on the development of the offensive tactics of 1918. Necessity drove part of these new tactics. The Germans lacked the industrial capacity to manufacture and supply the massive amounts of artillery that the Allies relied upon. The Germans instead focused on penetration along a narrow front by specialized formed shock troops or stormtroopers, followed and exploited by regular troops. These tactics caused such concern among the Allied leadership in the spring of 1918. As with the development of elastic defense, the German army followed the same bottom up, nine-step process. Lupfer revealed that once again, Ludendorff and the German High Command “solicited ideas and experiences from subordinate units, and this genuine interest gave the final product the wide ownership that eased the acceptance and application of the doctrine.”³¹ Bruce Gudmundsson in *Stormtrooper Tactics* supports Lupfer’s assertion regarding the importance of senior leadership in supporting bottom-up doctrinal changes.³²

Lupfer’s study of the German Army reiterates that successful military learning organizations are those that, upon detection of an error, engage in single or double loop learning as appropriate. They do so with the support of an organizational culture that within which an institution can create, acquire, interpret, disseminate and retain knowledge effectively to change its performance and achieve its goal.

³⁰ Great Britain War Office General Staff, *Summary of Recent Information Regarding the German Army and its Methods* (London: Harrison and Sons, 1917), 49. See also Ian Passingham, *All the Kaiser’s Men: The Life and Death of the German Army on the Western Front, 1914-1918* (Stroud: Sutton, 2003), 139-44.

³¹ Timothy Lupfer, *Dynamics of Doctrine*, 57.

³² Bruce Gudmundsson, *Stormtrooper Tactics: Innovation in the German Army, 1914-1918* (New York: Praeger, 1989), 83-85.

The Western Front posed enormous challenges to the British, French, and German armies. Technology had provided great opportunity to the defender in the form of the machine-gun, rapid-fire artillery and barbed wire while providing no advantages to the attacker. After the opening battles and rapid German advance, the front solidified into stalemate. Fighting a two front war, the Germans adopted a defensive policy on the Western Front while taking the offensive on the Eastern Front and the Balkans. However, the French insisted on expelling German troops from France and the British supported their ally to the fullest.³³

British conceptions of the attack quickly proved inadequate, yet unlike the Germans, they appear to have lacked a systematic, army wide approach to adaptation. The commanders of the British Expeditionary Force Sir John French and later Sir Douglas Haig left the process of adaptation to subordinate commanders, resulting in what Williamson Murray described as “an enormous disparity in the British Army’s performance on a unit-to-unit basis.”³⁴ The Canadian Corps stands out as one unit that adapted well under this decentralized process.³⁵

Argyris and Schön demonstrated that organizational learning begins with the detection and correction of error. Upon detection of error, the organization must engage in a learning process to ultimately change its behavior. David Garvin described this process as four complementary steps of acquiring or creating, interpreting, transferring, and retaining information that results in changed behavior. Successful adaptation requires the completion of all four steps. Schein and Nagl highlighted the importance of an organizational culture that facilitates the

³³ Peter Hart, *The Great War: A Combat History of the First World War* (New York: Oxford University Press, 2013), 213, iBooks.

³⁴ Williamson Murray, *Military Adaptation in War*, 86

³⁵ For a sample of non-Canadian references to the uniqueness of the Canadian Corps see John Keegan, *The First World War* (New York: A. A. Knopf, 2001), 367-68; Paul Kennedy, “Britain in the First World War” in Millett and Murray’s *Military Effectiveness, Volume I, The First World War* (Winchester, MA: Unwin Hyman, 1988), 70; Tim Travers, *How the War Was Won* (New York: Routledge, 1992), 47.

learning process by encouraging new ideas and recommendations from below. Timothy Lupfer demonstrated the validity of such an approach in his analysis of doctrinal change in the German Army during the Great War.

Analysis of the Canadian Corps' remarkable performance in the Great War through the lens derived from these descriptions and applications of learning organization theory reveals that the Corps' excellent performance during the war—particularly in the later years—resulted from its transformation into a learning organization. Just as the referenced learning organization theories describe, the Corps learned and improved over time by engaging in a process of acquiring or creating, interpreting, transferring, and retaining information. Supported by an organizational culture that encouraged and accepted change within the organization, the Canadian Corps possessed the traits of a learning organization, and demonstrated the expected behaviors of such an organization in its combat performance, as the following case studies demonstrate.

The Canadian Experience August 1914 – November 1916.

Despite its almost continuous engagement in combat operations during the first two years of the war, the Canadian Corps matured slowly as a learning organization. Unlike the rapid changes in doctrine accomplished by the German Army following the Somme, the Canadian Corps achieved evolutionary rather than revolutionary change. From the formation of the 1st Division to the final days of the Somme, change also came slowly and at great cost. Yet, the pace of change increased as the quality of its leadership, experience, and confidence grew.

The First Division

That Canada would go to war against the Central Powers on August 4, 1914 came as no surprise to the men of the 226 militia regiments spread across the country. The government, under the direction of the Chief of the General Staff, Major-General G. W. Gwatkin, began mobilization planning as early as 1911, and by 1914, the nation had a well-developed mobilization plan in

place. As historian, J. L. Granaststein observed, “While still a relatively unready nation, Canada was infinitely better prepared for war than at any previous time in its history.”³⁶ That the government would then ignore these plans and adopt an *ad hoc* method of mobilization surprised Gwatkin and his planners who had worked diligently to prepare for this significant task.

As Minister of Militia, Sir Sam Hughes took it upon himself to organize Canada’s division for service. Hughes was a Canadian nationalist wrapped within the blanket of the British Empire and had little time for professional soldiers. For Hughes, a militia of citizen soldiers embedded with a Canadian frontier spirit and a pragmatic “can do” attitude could take on the best of the German Army. Hughes threw out the mobilization plan and appealed directly to the militia regiment commanders for volunteers, ordering them to concentrate at Valcartier, north of Quebec City. That Valcartier had no facilities for training or mobilization did not seem to concern Hughes.³⁷

The organization and training of the first contingent was simply chaotic. Men flowed to Valcartier from all over the country, but with none of their regiments arriving at full strength, Hughes scrapped the traditional militia regiments and formed numbered battalions out of the volunteers. Despite the chaos of Valcartier, massive supply problems, and a dearth of professional soldiers to fill leadership positions, organized training gradually began to take place.³⁸ Training at

³⁶ J. L. Granaststein, *Canada's Army: Waging War and Keeping the Peace* (Toronto: University of Toronto Press, 2002), 55.

³⁷ Andrew Iarocci, *Shoestring Soldiers: The 1st Canadian Division at War, 1914-1915* (Toronto: University of Toronto Press, 2008), 17. Iarocci pointed out that under the original mobilization plan; troops were to concentrate at Petawawa, north of Ottawa, where facilities and training areas were at least somewhat prepared. Also Mark Zuehlke, *Brave Battalion: The Remarkable Saga of the 16th Battalion (Canadian Scottish) in the First World War* (Mississauga: J. Wiley and Sons Canada, 2008), 9.

³⁸ Morton, *A Military History of Canada*, 142. Hughes displayed his distaste for professionals by dispatching Canada’s only permanent force infantry unit, The Royal Canadian Regiment to Bermuda to relieve a British battalion for service.

Valcartier focused primarily at the company level and placed great emphasis on physical fitness and marksmanship. There seemed little opportunity to conduct tactical exercises at the battalion or brigade level.³⁹ Canada's first contingent encompassing the First Division and ancillary troops numbered over 36,000 men, of which 23,000 were born in Britain. Only 10,000 native born Canadians—including 1,200 French Canadians—belonged to the first contingent. However, the opposite trend appeared in the officer ranks where the clear majority was Canadian born.⁴⁰ The rush of patriotism on the outset of war placed recruiting officers in the enviable position of being highly selective with the first contingent. A study of two battalions, the 7th, and the 8th, by Andrew Iarocci found that 63.5 per cent of the 7th Battalion and 40 per cent of the 8th Battalion had some form of prior military service.⁴¹

The division arrived in Britain on October 15, 1914, just two months after the declaration of war—an impressive achievement. However, the division conducted practically no real training in Valcartier and thus it was far from ready for combat. The Division moved to Salisbury Plain where it trained under the direction of British Army veterans. At this point, the command structure of the division solidified. Division command went to Lieutenant-General Edwin Alderson, a British officer, since no Canadian possessed the experience required. An experienced officer, Alderson worked with Canadian troops in South Africa during the Boer War and as Andrew Iarocci wrote, “A positive relationship developed between Alderson and his Dominion soldiers, one which facilitated his appointment to command the Canadian Division fourteen years

³⁹ Zuehlke, *Brave Battalion*, 16. The 3rd Brigade for instance conducted only two tactical exercises at Valcartier.

⁴⁰ Granatstein, *Canada's Army*, 57; Iarocci, *Shoestring Soldiers*, 19. British born Canadians consistently enlisted at far greater rates than their Canadian born counterparts for the first two years of the war.

⁴¹ Iarocci, *Shoestring Soldiers*, 20.

later.”⁴² The brigade commanders, however, were all Canadian. Brigadier-Generals Mercer, Currie, and Turner commanded the 1st, 2nd, and 3rd brigades respectively, and Brigadier General Burstall the Division artillery.⁴³

The Canadians’ first taste of trench warfare came between February 17 and March 2, 1915 when they understudied British troops who introduced the inexperienced Canadians to the daily routine of trench warfare. Companies, battalions, and brigades rotated through the trenches under command of British formations.⁴⁴ On March 3, 1915 the Division officially entered the line and participated in its first major operation a week later supporting the failed British and Indian attack at Neuve Chapelle. The division conducted a demonstration on the British left to draw German reserves away from the British and Indian main effort.⁴⁵ Good planning and surprise gave the British and Indians the initial advantage and they achieved significant gains, but Neuve Chapelle foreshadowed things to come on the Western Front by highlighting a persistent problem of trench warfare—how to exploit breaches in the enemy line before the enemy counterattacked.

Both the British and the Indian unit commanders attempted to control the conduct of the battle at the highest level, but unreliable communication between the advancing troops and headquarters and a lack of initiative among junior officers stymied any opportunities. Nicholson described the impact of such a command system, “Never were the disadvantages of a rigid control

⁴² Iarocci, *Shoestring Soldiers*, 18. Iarocci pointed out that Alderson has not received the attention from Canadian historians as other leaders of the Canadian Corps. He argued that this occurred because of his absence from any of the major Canadian victories. Nevertheless, Iarocci asserted that he was the best man for the job.

⁴³ Nicholson, *Official History*, 22.

⁴⁴ For a good description of the apprenticeship process, see Iarocci, *Shoestring Soldiers*, 56-68.

⁴⁵ Nicholson, *Official History*, 53.

from a high level more disastrously demonstrated.”⁴⁶ The attack ground to a halt with gains left unexploited. Fierce German counter-attacks restored the line and the British suffered over 12,000 casualties for minimal gains.⁴⁷ This demonstrated the difficulties of command and control on the 1915 battlefield. Attempting to control the engagement at the highest level resulted in missed opportunities; what Argyris and Schön described as a detection of error. Their close proximity to the battle provided the Canadians with the opportunity to see this error, thus the 1st Division acquired information concerning command and control, an example of the first step in Garvin’s institutional learning process. Adaptation for the belligerents centered on determining how to exploit breaches in the opponent’s line.

Second Ypres

The division remained in the line until March 27 when, after a short period in reserve, it returned to the front in mid-April to hold part of the infamous Ypres Salient. Formed during heavy fighting in November 1914, the Ypres Salient jutted into the German lines around the town of Ypres, enabling the Germans to subject the occupying troops to fire from three sides. British and Indian troops suffered heavy losses defending the salient against German attacks, but the British intended to hold their ground. Andrew Iarocci estimated that the Allies suffered 80,000 casualties in these early battles and noted, “As early as the autumn of 1914, Ypres was already a powerful symbol of British sacrifice and determination.”⁴⁸ Here the Canadians received their baptism of fire. Within the salient, the British 28th Division occupied the Canadian right flank and the French 45th Algerian Division its left. The Germans adopted a defensive strategy on the Western Front while conducting offensives against the Russians on the Eastern Front. This

⁴⁶ Nicholson, *Official History*, 51.

⁴⁷ Nicholson, *Official History*, 53.

⁴⁸ Iarocci, *Shoestring Soldiers*, 78.

defensive strategy in the West entailed limited attacks to seize easily defensible terrain and to occupy Allied troops. The Germans planned one such attack at Ypres for mid-April. As the last major Belgian town not in German hands, seizing Ypres would not only shorten the German line but also deal a psychological blow to the Allies. The German attack at Ypres also served as an opportunity to experiment with a new weapon, one that they hoped could break the stalemate of the Western Front, poison gas.⁴⁹

The Germans launched their attack on April 22 with an intense artillery barrage centered on the French Colonial troops the Canadian left. At 1700, the Germans released immense clouds of chlorine gas that inflicted heavy losses on the French. The French division soon broke in panic leaving a large gap in the Allied line. Over the next three days, the Canadians and Algerians reinforced by fresh British troops fought an intense and confusing battle for the salient. Casualties climbed rapidly. On April 24, 1915 the Germans launched a second gas attack that pushed the Canadians back from the center of the salient. With communication to the rear in shambles company, battalion, and brigade commanders attempted to hold the line. The British suffered heavy casualties conducting a counter-attack on April 25, and successfully established a defensible line. As more British troops flowed into the salient, the Canadians withdrew after three days of intense fighting.⁵⁰

Second Ypres smashed the division, but its stubborn defense of the salient held the Germans just long enough to prevent a breakthrough, suffering horrendous casualties in the process. Bill Rawling wrote in *Surviving Trench Warfare* that, “Second Ypres proved to be the

⁴⁹ Iarocci, *Shoestring Soldiers*, 77-96 provides an excellent description of the salient, its importance to the Allies, and German intentions and tactics; see also Zuehlke, *Brave Battalion*, 48; Nicholson, *Official History*, 55-56.

⁵⁰ Iarocci, *Shoestring Soldiers* 97-192 provides the most detailed account of this confusing battle; see also Nicholson, *Official History*, 49-92; Cook, *Sharp End*, 109-60; Zeuhlke, *Brave Battalion*, 50-64.

worst battle the 1st Division would fight in the course of the war, half of its infantrymen becoming casualties.”⁵¹ That three out of twelve battalion commanders died at Ypres is an indication of the ferocity of the fighting.⁵² The Canadians quickly drew some early intuitive lessons from their first major engagement. Leadership at the lowest levels played a key role in the defense of the salient. Mixed groups of men from destroyed platoons and companies rallied under the nearest junior officer or NCO and fought stubborn withdrawals buying time for reinforcements. As Tim Cook noted in *The Sharp End* this degree of initiative among junior leaders already marked the Canadians as somewhat different from their British counterparts. “This tactical improvisation would remain a staple among the Canadian fighting forces for the next three and a half years of war.”⁵³

The Canadian Division’s staff appears to have grasped the importance of initiative and leadership that they observed in the execution of the combined British and Indian attack at Neuve Chapelle, transferring this understanding to the 1st Division, just as described in the second and third parts of Garvin’s institutional change process. However, the performance of senior leadership at the brigade and division level drew much criticism and indicates that such lessons did not reach a receptive audience throughout the 1st Division. For instance, 2nd Brigade Commander Brigadier-General Currie left his command post on April 25 seeking orders and reinforcements from the division headquarters, a move that opponents later characterized as an act of cowardice. His counterpart at the 3rd Brigade, Turner, consistently failed to comprehend his division commander’s orders and at least one battalion commander allegedly fled the

⁵¹ Bill Rawling, *Surviving Trench Warfare: Technology and the Canadian Corps, 1914-1918* (Toronto: University of Toronto Press, 1992), 35; also Iarocci *Shoestring Soldiers*, 180-82 and appendix I provides a detailed breakdown of casualties.

⁵² The commanders of the 4th, 7th, and 10th Battalions.

⁵³ Cook, *The Sharp End*, 162.

battlefield.⁵⁴ Second Ypres tested the division, which faced the enormous pressure of a German offensive and remained a cohesive and functioning unit. The battle reinforced the importance of leadership but provided scant guidance on taking the fight to the enemy. Winning the war would require taking the offensive, and that would prove far more difficult than holding the line.

Festubert

As the junior partner in the Anglo-French alliance, the British found themselves in the unenviable position of supporting the seemingly endless French offensives on the Western Front. British offensives usually coincided with larger French attacks and aimed to pin down German forces. The British attack of May 1915 at Festubert, thirty-five kilometers southwest of Ypres, is an example of one such operation designed to support a French offensive – in this case, an attempt to seize Vimy Ridge. Despite the severity of its losses, the large number of replacements in England made replenishing the Division's ranks straightforward. The Canadian authorities in England made no attempt to direct men from one part of the country to battalions recruited from the same area, such as sending Calgary men to the 10th Battalion or Montrealers to the 14th Battalion. It seems, however, that once the men arrived in France they found their way to the appropriate units regardless of their orders, easing their transition into combat. By mid-May, the Division replenished most of its losses but it had not reached the level of proficiency held prior to Ypres. Yet as Nicholson recorded in the *Official History* the Division found itself back in action, "less than two weeks after losing half its fighting strength at Ypres – far too short a time for units to assimilate their infantry reinforcements."⁵⁵ Schein and Nagl described the importance of organizational culture in facilitating organizational change. An influx of replacements so soon

⁵⁴ Iarocci, *Shoestring Soldiers*, 161.

⁵⁵ Nicholson, *Official History*, 103-104; see also Iarocci *Shoestring Soldiers*, 187-88; and Zeuhlke *Brave Battalion*, 65-66.

after Ypres provided little time to adopt the organization's culture. This challenged the effective transfer of information throughout the 1st Division. The inability to integrate these new troops proved disastrous at Festubert.

British attacks at Festubert on May 15 and 16, 1915 yielded some success. Sir John French, Commander of the British Expeditionary Force ordered Brigadier General Turner's 3rd Canadian Brigade, having just arrived, to exploit this success. Turner had only hours to prepare to attack across unfamiliar terrain with his newly arrived troops. Poor planning, coordination, and execution characterized the Canadian Brigade's attacks on May 17 and 18. The rest of the Division joined the battle on May 19 and for six days attacked German strongpoints, meeting some success but mostly finding only disappointment. In the end, Festubert accomplished little, costing the Canadians over 2,600 casualties for a paltry gain of only 600 yards.⁵⁶ However, Festubert provided the Canadians a hard won lesson in the value of planning and preparation. Andrew Iarocci noted that Brigadier-General Currie, commanding the 2nd Brigade, regarded the lack of support for his troops as unacceptable. In a tense discussion with Alderson he "expressed particular outrage with the orders he had received"⁵⁷

Currie's anger stemmed from the fact that despite clear evidence to the contrary, attacking prepared positions supported by machine-guns and ample artillery doomed the attacking troops to failure. Nicholson noted that the British High Command did not share this opinion and "appeared satisfied that success was merely a matter of persistence – and more guns and ammunition."⁵⁸ Bill Rawling wrote that the Canadians learned a different lesson at Festubert, "that artillery and infantry had to develop a closer relationship."⁵⁹ Thus, at Festubert the 1st

⁵⁶ Nicholson, *Official History*, 103.

⁵⁷ Iarocci, *Shoestring Soldiers*, 223.

⁵⁸ Nicholson, *Official History*, 104.

⁵⁹ Rawling, *Surviving Trench Warfare*, 46.

Division acquired and correctly interpreted information concerning the necessity of planning, preparation, and all arms cooperation, another example of Garvin's first and second criteria; whether the organization could effectively transfer and retain these lessons remained to be seen. In any case, the lessons were beginning to pile up. Ypres proved the value of junior leadership and Festubert the importance of cooperation amongst the various arms. Consolidating these lessons remained the Canadians' challenge.

After Festubert, the Canadians saw no major action until the spring of 1916. Nevertheless, German artillery, gas attacks, and sniping took a constant toll and the 1st Division suffered 2,692 casualties including 688 deaths between September and December 1915.⁶⁰ Not content to rest passively on the defensive during the winter months the British insisted on a policy of limited but constant pressure on the Germans. Trench raiding became a viable means of keeping pressure on the Germans without committing men or material to large-scale offensives. The Canadians soon developed an impressive reputation as raiders and raiding became a learning laboratory, providing an ideal opportunity to gain combat experience. Raiding required detailed planning, training, aggressiveness, and initiative at all levels, features that would eventually characterize the Canadian set-piece attack. Trench raids aimed to keep the Germans on edge, capture prisoners, and gain intelligence. Raids ranged in strength from a few men to battalion strength and provided a wealth of experience to the troops and planning staffs at all levels.⁶¹

The 2nd Division arrived in France in September 1915, leading to the creation of the Canadian Corps. General Alderson naturally assumed the role of Corps commander. The

⁶⁰ Nicholson, *Official History*, 127.

⁶¹ Cook, *Sharp End*, 291-302 asserted that competition between Canadian battalions and brigades regarding trench raiding reduced their effectiveness as each unit attempted to outperform the other leading to rushed and ill planned raids. Paddy Griffith, *Battle Tactics on the Western Front: The British Army's Art of Attack* (New Haven: Yale University Press, 1994), 60-62 stated that British troops across the wider BEF were less than enthusiastic regarding trench raiding.

Canadians now faced the challenge of transferring information, acquired and interpreted by the 1st Division to the newly arrived 2nd Division. Brigadier-Generals Currie and Turner assumed command of the 1st and 2nd Divisions respectively and the Corps settled into its first winter in the trenches. The winter lull provided an opportunity to collect the lessons of Ypres and Festubert. Like many elements of the British Army the Canadian Corps formed a training cell to collect, analyze, and disseminate lessons learned both within the Corps and amongst other units of the British Army. This however was an *ad hoc* process that lacked any central direction from the British High Command. Sir Douglas Haig, who assumed command of the British Expeditionary Force on December 19, 1915, did not create any type of formal training organization.⁶² Even amongst the smaller Canadian Expeditionary Force, a gap developed between the lessons learned at the front by the Corps and those taught at the Canadian training depots in Britain.⁶³ Thus, the Canadian Corps did not effectively transfer the lessons learned from Ypres and Festubert outside the organization to its only source of replacements.

In addition to the value of junior leadership and the need to coordinate artillery, Ypres and Festubert also demonstrated to the Corps the value of the machine-gun and the grenade. The Corps created specialized platoons of each at the battalion and brigade level in an effort to maximize the effectiveness of these weapons. Yet these organizational changes were strictly tactical in nature and the Corps still struggled with the command and control at the operational level. These new platoons simply robbed companies and rifle platoons of much needed men and firepower. Furthermore, the Corps struggled to extend the lessons learnt from raiding, beyond the battalion level.⁶⁴

⁶² Murray, *Military Adaptation in War*, 20.

⁶³ Rawling, *Surviving Trench Warfare*, 54.

⁶⁴ Zeuhkle, *Brave Battalion*, 87.

The Crucible – The Somme, 1916

1916 was a bloody and frustrating year for the Canadians—and yet, it also marked a considerable period of maturation. By the end of the year, the Canadians had suffered through the crucible of the Somme and emerged as a homogenous corps of four large divisions having learned a series of critical lessons—although this cost them dearly.

At the Chantilly conference of December 1915, the Allies discussed operations for the coming year. With no unity of command on the Western Front, the British and French Armies only attempted to coordinate their actions while supporting their Russian and Italian allies. Rather than a synchronized strategy, the Allies simply agreed to launch spring offensives on each of their respective fronts as soon as possible.⁶⁵

The British Expeditionary Force grew considerably as a new wave of recruitment replaced the losses of 1914 and 1915. However, these new divisions suffered from a lack of experienced NCOs and officers. Haig desperately needed time to train and integrate these new divisions and pushed for a delay in the agreed British offensive. Despite the Allies' intentions of seizing the initiative, the Germans struck first, launching a massive offensive at Verdun on February 21, 1916. The Verdun campaign lasted nine months and consumed hundreds of thousands of French and German troops.⁶⁶

As the French Army slowly disintegrated at Verdun, its commander-in-chief Marshall Joffre pleaded with Haig for a British offensive to relieve the pressure. Throughout the spring, Haig made his preparations, although he felt he needed more time to prepare his inexperienced troops. The Battle of the Somme began on July 1 with the greatest single day of casualties in

⁶⁵ Nicholson, *Official History*, 130; Zeuhkle, *Brave Battalion*, 119-23; Philpott, *Three Armies on the Somme*, 69-72.

⁶⁶ Keegan, *The First World War*, 278-86.

British history. The Canadian Corps, now at three divisions, remained in reserve during Haig's initial Somme offensive but it soon engaged in its share of the fighting.

The Corps' first major action in 1916 occurred in the now familiar Ypres Salient, this time on the southern portion near village of St. Eloi. Here the British planned a limited attack to seize key terrain that dominated the salient and from which the Germans could observe the Allied lines. The British detonated a series of massive underground mines on March 27, 1916 in an attempt to break through the German lines. The resulting craters quickly became key terrain in their own right and both sides fought to control them. After a week of confused combat, the 2nd Canadian Division relieved the exhausted 3rd British Division on April 4, 1916. Much like the 1st Division's initial engagement at Ypres, in its first major engagement the 2nd Division performed poorly. David Campbell remarked, "The battle is remembered as one of Canada's worst single defeats of the First World War."⁶⁷ At St. Eloi, lack of situational awareness consistently eluded the division commander, Major-General Richard Turner. The Canadians, like the British before them, failed to understand the battlefield, partly due to the poor handover conducted by the 3rd British Division.⁶⁸ Throughout the battle, a stubborn misunderstanding persisted concerning exactly which craters each side held. This resulted in a series of poorly planned and executed attacks yielding only additional casualties. Turner's division fought in terrible conditions and suffered from intense and accurate German artillery. Only on April 15, 1916 after nine days of

⁶⁷ David Campbell, "A Leap in the Dark – Intelligence and the Struggle for the St. Eloi Craters: Reassessing the Role of Major-General Richard Turner," in *Great War Commands: Historical Perspectives on Canadian Army Leadership*, ed. Andrew B. Godfrey (Kingston: Canadian Defence Academy Press, 2010), 21-22.

⁶⁸ William Frederick Stewart, "Every Inch a Fighting Man: A New Perspective on the Military Career of a Controversial Canadian, Sir Richard Turner" (PhD diss., University of Birmingham, 2012), 104, accessed December 30, 2015, <http://etheses.bham.ac.uk/3389/1/Stewart12PhD.pdf>

operations, did the Division realize the discrepancy between what it actually held and what it thought it held. Turner called an end to the battle.⁶⁹

St. Eloi highlighted the difficulty of command and control in the chaotic conditions of 1916. Battalion commanders quickly lost situational awareness finding themselves unable to control their troops or maintain contact with their parent brigades. Coordinating artillery and reinforcing success proved next to impossible and casualties amongst platoon and company leadership caused confusion.⁷⁰ A 2nd Division report written shortly after the battle emphasized “That all subordinates must be prepared to act on their own initiative. The one unforgivable sin when in difficulties is to do nothing and wait for orders.”⁷¹ St Eloi proved that the Corps could not effectively transfer critical knowledge it previously acquired and interpreted, a key element of Garvin’s learning cycle. The 1st Division’s experience at Neuve Chapelle and Ypres proved the importance of initiative at all levels—particularly in the chaos of no man’s land—yet the 2nd Division suffered from an overly restrictive command structure that stymied initiative. The 2nd Division arrived in France nearly six months prior to its first engagement at St. Eloi; thus, the Corps had ample opportunity to disseminate the lessons learned by the 1st Division, including the importance of initiative. The 2nd Division’s failure at St Eloi demonstrated that the Corps did possess an effective means of transferring information.

St Eloi also created a crisis of command within the Corps. So inept had been the British approach to St. Eloi, both in the British 3rd and the Canadian 2nd Divisions, that the British High Command demanded answers. Alderson, as Corps commander, blamed Turner, commander of the 2nd Division whom he viewed as incompetent since at least 2nd Ypres the year before. Turner earned a Victoria Cross in South Africa and was one of Canada’s few pre-war military heroes.

⁶⁹ Nicholson, *Official History*, 137-45; Cook, *Sharp End*, 323-36.

⁷⁰ Rawling, *Surviving Trench Warfare*, 80.

⁷¹ Rawling, *Surviving Trench Warfare*, 61.

Fully aware of Turner's strong political position, Alderson instead sought the removal of Brigadier H. D. B. Ketchen who as commander of the 6th Brigade also performed poorly. Alderson asked Turner to give up Ketchen, Turner not only refused but also levied charges of incompetence against Alderson. Alderson could not accept such an accusation from a subordinate and demanded Turner's removal. The Canadian Government made clear its displeasure with the poor handling of Canadian troops by the British. Hence, Alderson, not Turner, ultimately paid the price for St. Eloi.⁷²

Since no Canadian officer possessed the requisite experience to command the Corps, another British officer, Sir Julian Byng replaced Alderson.⁷³ Byng seemed the perfect fit for the Canadians. Terry Cook described him as "the opposite of everything that the aloof British generals seemed to represent, and he won over the hearts of the Canadians."⁷⁴ Byng sought to create a sense of pride within the Corps. Clearly, the Canadians were different from the rest British Army. However, Byng thought his new Corps should consider themselves as better. Byng instilled this belief in the Corps and he skillfully played upon idea of Canadians as "wild colonials from the outer reaches of the Empire."⁷⁵

Byng had barely taken command before the Germans once again tested the Corps. After a period of rest after St Eloi, the Corps reoccupied part of the Ypres Salient by June 1916. On June 2, 1916, the Germans launched an offensive at Mount Sorrel in an effort to divert British

⁷² David Campbell's assessment of the battle is that given the conditions faced by the 2nd Division "not even the most talented commanders would have fared any better." Campbell asserted that St Eloi was a division fight and hence Turner is ultimately responsible but he was ill served by a poorly developed intelligence corps that consistently misinterpreted raw intelligence. See Campbell, "A Leap in the Dark," 21-52.

⁷³ Byng later served as the 12th Governor-General of Canada from 1921 to 1925.

⁷⁴ Cook, *Sharp End*, 344.

⁷⁵ Cook, *Sharp End*, 344.

resources from the Somme. The German attack fell squarely on the untested 3rd Division, which had joined the Corps in December 1915 yet experienced no major combat. Major-General Mercer, the former commander of the 1st Brigade commanded the division, once again displaying the Canadian preference to promote from within the Corps. Mercer's division reflected two changes to the Canadian view of the war. First, it contained a greater number of Canadian born soldiers than the 1st and 2nd Divisions, although British born recruits remained the majority.⁷⁶ Secondly, its 8th Brigade comprised four battalions of Canadian Mounted Rifles. Organized as standard infantry battalions, these former cavalry units reflected an acknowledgement that this was an infantryman's war.

At Mount Sorrel, the Germans provided ample warning an impending attack yet the inexperienced brigades and battalions of the 3rd Division did little to prepare for it. The opening German barrage struck the Canadians as Mercer inspected the lines. Heavy and accurate German artillery fire obliterated the trenches of the 8th Brigade killing Mercer and severely wounding the 8th Brigade's commander, whom the Germans later captured. The German assault swept over the Canadian lines and inflicted enormous casualties.⁷⁷ The next two days saw a series of poorly organized and executed counter-attacks by the 3rd Division. The attacks at Mount Sorrel suffered from poor cooperation with the artillery and lack of communication between attacking battalions and the brigade and division headquarters. The Germans easily repelled these uncoordinated and piecemeal attacks. The 3rd Division's experience at Mount Sorrel provided another indication that the Corps struggled to transfer or disseminate information it acquired or created earlier. Despite having accumulated more than a year of collective experience in trench warfare, the 3rd Division failed to take the necessary defensive precautions. Furthermore, its poorly orchestrated

⁷⁶ Cook, *Sharp End*, 348.

⁷⁷ The 4th Battalion, Canadian Mounted Rifles suffered an 89% casualty rate. Nicholson, *Official History*, 149.

counterattacks indicated that it either did not interpret the lessons learnt by other elements of the Corps regarding the coordination of artillery and planning or such information was not transferred systematically through the Corps.

Byng ordered Currie's 1st Division to relieve the 3rd Division, a move that caused much animosity between the two units. Currie refrained from launching an immediate attack, demonstrating his preference for well-planned attacks. Instead, Currie planned an innovative night assault preceded by five days of artillery preparation. This attack on June 13, 1916 recovered the lost ground but casualties remained high. Although cooperation with the artillery improved, numerous instances of friendly fire caused unnecessary casualties. Nevertheless, Currie's success reflected a growing appreciation within the Corps for the methodically planned set-piece battle.⁷⁸ The performance of the 1st Division indicated that the leadership employed a method that resembled Garvin's learning cycle, but it did so unevenly throughout the Corps. For instance, the 1st Division's attacks benefited from improved artillery cooperation and improved planning, the 3rd Division performed no better in these areas than it had in previous engagements. This demonstrates that some elements of the Corps, and therefore the Corps as a whole, had not yet fully implemented the methods one sees in a learning organization.

Haig's Somme offensive continued throughout the summer and fall of 1916. The Corps moved to the Somme front in early September—Haig intended to use the Corps in another offensive. While the 1st Division held the Corps frontage, the 2nd and 3rd Divisions conducted their preparations. Another bloody and inconclusive battle at Courcellette saw the first use of the tank on the Western Front with Turner's 2nd Division reinforced by seven tanks. The attack

⁷⁸ Andrew B. Godefroy, "The Advent of the Set-Piece Attack: Major-General Currie and the Battle of Mount Sorrel, 2-13 June 1916," in *Great War Commands: Historical Perspectives on Canadian Army Leadership*, ed. Andrew B. Godefroy (Kingston: Canadian Defence Academy Press, 2010), 1-20; Nicholson, *Official History*, 147-54; Cook, *Sharp End*, 377; Zuehkle, *Brave Battalion*, 113-117.

commenced on September 15, 1916 after a massive and well-placed artillery barrage. Both divisions achieved their initial objectives but the advance stalled and the tanks performed poorly. Haig's ambitious objectives remained out of reach.

The Corps launched another assault on September 26, 1916 to seize Thiepval Ridge, a piece of key terrain. The Corps cooperated with the British 2nd Corps and over two days captured most of its objectives, with the exception of the particularly strong Regina Trench. Two further attempts by the 1st and 2nd Divisions on October 1 and 8, 1916 also failed due to ineffective artillery preparation. The Germans adapted to the overwhelming Allied superiority in artillery by evacuating their front line trenches whenever an attack seemed imminent. So long as the Canadians treated artillery fire and infantry maneuver as two distinct and consecutive steps the Germans could reoccupy their forward defenses before the assaulting infantry could reach them. Only by closely integrating artillery fire and infantry maneuver could the Corps achieve the desired effect⁷⁹ The bulk of the Corps departed the Somme and moved to a relatively quiet sector of the front, leaving behind the newly arrived 4th Division which remained in the line. The 4th Division, under command of the British 2nd Corps again tried to take the Regina Trench on October 21 and 25, 1916 before finally succeeding in a night attack on November 10 to 11.⁸⁰

Analysis

Canada's Army grew dramatically between the British Empire's declarations of war against the Central Powers in August 1914 to the final battles of the Somme in November 1916. Beginning with only a small permanent force of 3,000 men, plagued by internal politics and lacking modern weaponry, by November 1916 Canada fielded a large corps of four divisions. Throughout this initial period, the Canadian Army struggled to adapt to the challenges of modern,

⁷⁹ Nicholson, *Official History*, 176.

⁸⁰ Nicholson, *Official History*, 174-88; Cook, *Sharp End*, 467-506.

industrial warfare on the Western Front. Between the 1st Division's initial engagement at Ypres in April 1915 and the operations of late 1916 involving all four divisions, the Canadian Corps did not consistently perform as a learning organization. In fact, with the exception of the limited success at Mount Sorrel, the Corps performed rather poorly. According to Argyris and Schön, organizational learning involves the detection and correction of error. The Corps' poor performance at Ypres, Festubert, St. Eloi, and throughout the Somme provided numerous opportunities to detect errors but the Corps consistently failed to correct them. Garvin described a learning organization as one that systematically acquires or creates, interprets, transfers, and retains new knowledge in order to change its behavior. These characteristics were notably absent within the Corps during this period.

During the same period the Corps engaged in near-constant combat, which provided many opportunities to acquire knowledge. Subordinate organizations learned specific lessons from each engagement, but the Corps often failed to extend that knowledge amongst its divisions—a key element of Garvin's learning cycle. For instance, at Ypres in April 1915 the 1st Division acquired knowledge regarding the value of junior leadership and initiative. However, the attacks of the 2nd Division at St Eloi suffered from a lack of initiative because lessons already learned in previous engagements did not transfer to new divisions as they joined the Corps. While shortage of time can make this process difficult, 2nd Division arrived in France six months prior to St Eloi; thus, it possessed ample time to instill the value of junior leadership and initiative before its commitment to the line. Similarly, the 1st Division's offensive at Festubert in May 1915 proved the importance of closely coordinating infantry maneuver with artillery fire—a lesson that various small-scale trench raids confirmed. Nevertheless, multi-division attacks on the Somme, especially at Thiepval Ridge, suffered because of poor artillery coordination. Again, the Corps did not consistently disseminate and then implement lessons from previous engagements among its subordinate units.

The 3rd Division's poor performance at Mount Sorrel in June 1916 provides another indication of poor dissemination of information across the Corps—in this case, failure to share operational intelligence. Despite clear indications of an imminent German offensive, the attack caught the 3rd Division off guard and ill prepared for the assault, resulting in a loss of key terrain. Despite nearly a year of collective experience in trench warfare, the 3rd Division failed to take even basic precautions. The subsequent counter-attack by the 1st Division with its emphasis on detailed planning and close artillery coordination provided evidence of organizational learning, but only within that division. The 2nd and 3rd Divisions' poor performance throughout the Battle of the Somme indicates an uneven distribution of key lessons across the Corps. This extends to the inability of the Canadian training establishments in Great Britain and France to meet the Corps' needs. Adequate time existed to ensure mobilizing divisions received adequate intelligence, but time could not make up for poor dissemination of information. Replacements received ad hoc and inconsistent training before arriving in France thereby placing an additional training burden on the divisions at the front.

Finally, Corps' leadership made little effort to acquire information from other organizations. Although the British Army did not formalize a process to acquire or create, interpret, transfer, and retain information, neither did the Corps seek information—whether from the disparate elements of the British Army writ large, or from amongst allies in the fight against the Germans. Over the course of nearly eighteen months of combat on the Western Front, spanning from May 1915 to November 1916, the Canadian Corps did not, as a whole, display the characteristics of a learning organization. It did not consistently institute a process of acquiring or creating, interpreting, transferring and retaining knowledge in order to change its behavior. Only in isolated cases, and among individual subordinate organizations, did any such learning organization behavior appear. As a result, the Corps sustained a high rate of casualties while it failed to achieve its objectives.

The Canadian Experience November 1916 – November 1918.

Professionalizing the Corps

Over the course of 1916, the Corps changed dramatically. It doubled in size from two to four divisions, acquired an aggressive and innovative commander in Sir Julian Byng, and solidified its unique persona despite suffering horrendous casualties. That the Corps could endure such casualties and not only maintain but also grow its esprit de corps is remarkable. The Corps lost more than 1,300 personnel at St Eloi, over 5,700 at Mt. Sorrel, and over 24,000 over the course of the Battle of the Somme—in addition to the regular “wastage” of trench warfare.⁸¹ By the end of the war, many infantry battalions had experienced casualty rates between 400 and 500 percent of their initial strength.⁸² These losses included one-third of all infantry battalion commanders.⁸³

Many battalions instituted a “Left out of Battle” policy, in which a handful of officers and NCOs remained in the trenches to reconstitute the battalion in the event of catastrophic losses. According to Tim Cook, such a policy enabled the retention of hard won knowledge within the battalion. “As long as a core group of men survived, the battalion could be rebuilt, traditions passed on to new men, and the essential lessons of trench warfare inculcated in new recruits.”⁸⁴ Thus, by 1916 the Corps began to undertake measures to ensure the retention of information, Garvin’s fourth criteria of a learning organization. For example, the Corps preferred to replace combat leaders from within rather than import new leadership from the training battalions.

⁸¹ Nicholson, *Official History*, 145, 154, and 198.

⁸² Cook, *Sharp End*, 470.

⁸³ Rawling, *Surviving Trench Warfare*, 97. By April, 1917 only 150 members of the Princess Patricia’s Canadian Light Infantry’s original 1914 battalion remained. See also Cook, *Sharp End*, 340.

⁸⁴ Cook, *Sharp End*, 470.

Canadian battalion commanders had no qualms replacing officers with experienced NCOs, making commissioning from the ranks commonplace. The Corps' senior leaders valued experience and placed trust in junior leaders. In contrast, formal education, wealth, or family connections carried little weight. The Canadian policy of individual, rather than unit replacements enabled the dissemination of hard won experience throughout the Corps—a capability that proved essential as the high casualty rate took its toll among even the most experienced veterans.⁸⁵

With the conclusion of the terrible battles of 1916, the Canadian Corps withdrew from the Somme. It occupied a relatively quiet sector of the front near Arras and prepared for another winter in the trenches. Its commander, Julian Byng, seized the opportunity to train his Corps. Byng's impact on the professionalization of the Corps cannot be overstated but he was initially less than enthusiastic when ordered to assume command. When Haig congratulated Byng on his new appointment, Byng responded, "Why am I sent to the Canadians? I don't even know a Canadian. I am ordered to these people and will do my best, but I don't know that there is any congratulations about it."⁸⁶ Historian Christopher Pugsley asserted that for all his misgivings about the Canadians, Byng realized that the Canadian Corps had to be "treated and trained differently from Regulars, noting it was important for senior leaders to become involved at levels that would not be contemplated in a Regular formation."⁸⁷ This meant ensuring solid leadership throughout the Corps, and Byng demanded of the Canadian government that he have *carte blanche* to make changes in the Corps command structure. Byng noted that "The men are too

⁸⁵ Cook, *Shock Troops*, 203.

⁸⁶ Sir Julian Byng quoted in Patrick Brennan, "Julian Byng and Leadership in the Canadian Corps." in *Vimy Ridge: A Canadian Reassessment*, eds. Geoffrey Hayes, Andrew Iarocci, and Mike Bechthold (Waterloo, Ontario: Wilfred Laurier University Press, 2007.), 88.

⁸⁷ Christopher Pugsley, "Learning from the Canadian Corps on the Western Front," *Canadian Military History* 15, no. 1 (Winter 2006): 12.

good to be led by politicians and dollar magnates, and if the credit of the Corps is to be augmented, the men must be led by leaders. I don't want Imperial officers but I want to shove on the Canadians who have proven their worth and get rid of the Bumstunts."⁸⁸ Byng wasted no time—by April 1917, two of the four division commanders, six of the twelve infantry brigade commanders, two of the four division artillery commanders and forty of forty-nine battalion commanders assumed command under Byng's tenure. Thus, Byng recognized and capitalized on the Corps' unique features. He encouraged its members to link their identity to the Corps, not to a particular division, brigade, or battalion. This gave the Corps a powerful organizational culture that rested on a solid foundation of homogeneity, a feature that left no doubt regarding soldiers' relationship to their unit, while easing the implementation of new concepts and ideas.⁸⁹

Byng had little choice but to move with urgency in preparing the Corps for operations in 1917. In January, the Allies agreed to launch a spring offensive on the Western Front. The Allied main effort rested with the French under their new commander, General Robert Nivelle; Haig's British Expeditionary Force would set the conditions by drawing away German reserves. The capture of the indomitable Vimy Ridge marked the Canadian contribution to this grand scheme.⁹⁰

Located three kilometers north of the key logistical hub of Arras, Vimy Ridge ran an imposing seven kilometers in length and anchored the German line this sector of the Western Front. The ridge dominated the surrounding terrain and provided the Germans an unimpeded view of the Allied lines. The Germans captured the ridge in 1914 and held it ever since, defeating three French attempts to retake it. Following the final French assault in the autumn of 1915, the

⁸⁸ Sir Julian Byng, quoted in Brennan, "Julian Byng and Leadership in the Canadian Corps." in *Vimy Ridge: A Canadian Reassessment*, 88.

⁸⁹ Sir Julian Byng, quoted in Brennan, "Julian Byng and Leadership in the Canadian Corps." in *Vimy Ridge: A Canadian Reassessment*, 90-91.

⁹⁰ Nicholson, *Official History*, 234-39; Cook, *Storm Troops*, 74-76.

Vimy front remained quiet and the French tried their luck elsewhere. In the *Official History*, Nicholson summarized the terrain's tactical importance, "Vimy Ridge was tactically one of the most important features on the entire Western Front...The Ridge was the keystone of the defences linking the new Hindenburg system to the main German lines."⁹¹ There could be no viable Allied advance in this sector of the front as long as the Germans held Vimy Ridge. With the impending attack on Vimy in mind, Byng intensified his efforts to improve the Canadian Corps.

Byng initiated a deliberate effort to share lessons learned, which Patrick Brennan and Thomas Leppard described as a process that "consisted of critically assessing each battle and clearly delineating all lessons learned in detailed after-battle reports, then altering doctrine and tactics accordingly, and finally training officers and men in the new way."⁹² Byng's analysis acknowledged those areas where the Corps performed well while identifying areas for improvement. To support this process Byng dispatched his most trusted and experienced division commander, Currie, to examine the French lessons learned at Verdun. In many ways Currie's report supported Byng's own assessment. Byng's implementation of a formalized process to share lesson learned marked a change from the previous *ad hoc* process instituted by Alderson. By implementing a formal process, Byng ensured that the Corps systematically interpreted and then transferred knowledge. Furthermore, by dispatching Currie to visit the French at Verdun, Byng exercised an alternative method of acquiring information. These efforts illustrate the extent

⁹¹ Nicholson, *Official History*, 244; Cook, *Shock Troops*, 76-79.

⁹² Patrick Brennan, and Thomas Leppard, "How the Lessons were Learned: Senior Commanders and the Moulding of the Canadian Corps after the Somme," in *Canadian Military History Since the 17th Century: Proceedings of the Canadian Military History Conference, Ottawa, 5-9 May 2000*, ed. Yves Tremblay (Ottawa: National Defence, 2001), 135.

of the transition taking place in the Canadian Corps under Byng's leadership, as these measures represent three of Garvin's characteristics of learning organizations.

At Mount Sorrel Currie had proved the value of methodical and detailed planning; afterwards he insisted on rehearsals before any commitment of his troops to combat.⁹³ In his visit to Verdun, Currie noted that the French also recognized the importance of rehearsals prior to the assault and remarked, "The French attach the greatest possible importance to this special training of attacking troops, and in my opinion it is the greatest lesson to be learned from our visit to Verdun."⁹⁴ Detailed rehearsals became a key part of Byng's preparations for Vimy. Rehearsals provided an efficient means to disseminate information and ensure the implementation of the latest techniques throughout the Corps.

Junior leadership played a prominent role in the Corps' operations, often contributing directly to the unit's overall success. In the chaos of no man's land, junior leadership often made the difference for men who simply needed a firm hand to guide them or an example to motivate them to press on. Tim Cook noted that by 1916, "experienced Canadian commanders estimated that about twenty minutes after zero hour in a battle, the battalion commander lost his influence."⁹⁵ Currie discovered that the French were in many ways ahead of the Canadians in "decentralizing the command structure, a reorganization that empowered soldiers to make their own choices to changing battlefield circumstances."⁹⁶ Such views led to a re-invigoration of the platoon as a critical battlefield formation.

The platoon—a significant formation in pre-war British doctrine—lost its importance in the early years of combat on the Western Front as commanders wrestled with the industrial scale

⁹³ Rawling, *Surviving Trench Warfare*, 74; Zuehkle, *Brave Battalion*, 112.

⁹⁴ Arthur Currie quoted in Rawling, *Surviving Trench Warfare*, 91.

⁹⁵ Cook, *Sharp End*, 459.

⁹⁶ Cook, *Storm Troops*, 20.

of WWI-style warfare. Experience on the Somme proved that only the platoon possessed sufficient mobility to advance far enough in the attack to close with and destroy enemy strongpoints once the supporting artillery moved on. Byng recognized the importance of both the platoon and the platoon commander and asserted, “The largest unit that, under modern conditions, can be directly controlled and manoeuvred under fire by one man is the Platoon. The Platoon commander is therefore in most cases the only man who can personally influence the local situation. In fact, it is not too much to say that this is the Platoon Commander’s war.”⁹⁷ To support the re-invigoration of the platoon, Byng collapsed the specialty platoons of machine-gunners and grenadiers formed in 1915 and pushed these weapon systems back to the rifle platoons, giving them the firepower they needed to survive on the battlefield and exploit the potential inherent in their mobility.⁹⁸

Byng set the optimal platoon size at between 28 and 42 men including a Lewis gun section, a bombing section and two rifle sections. The Lewis gun weighed thirty pounds, significantly less than the Vickers’ eighty pounds. Thus, the Lewis gun was light enough that one man could carry it into battle and it supplied the platoon with much needed firepower. Similarly, with a range of one hundred yards, the rifle grenade provided the platoon with its own indirect fire asset.⁹⁹ The resurgence of the platoon coincided with changes in tactical doctrine across the British Expeditionary Force. The ineffective 1914-style linear advance gave way to attacks by groupings of self-contained diamond-shaped units, often of platoon size and possessing the optimal balance of firepower and mobility to have a chance at getting across no man’s land. By echeloning these units, the Allies learned that the first wave could often bypass stubborn German

⁹⁷ Sir Julian Byng quoted in Pugsley, “Learning on the Western Front,” 13.

⁹⁸ Cook, *Shock Troops*, 27; Zeuhkle, *Brave Battalion*, 150.

⁹⁹ Rawling, *Surviving Trench Warfare*, 50-58.

positions as second echelon platoons engaged them, allowing the lead platoons to continue to their objectives.¹⁰⁰ Byng supported the resurgence of the platoon by exercising two criteria of a learning organization: acquiring information and interpreting lessons. Specifically, he could see how the unique conditions on the Western Front returned the platoon interpreted the outcome of combat action at the Somme where the platoon's mobility made it an invaluable attack formation.

However, the Corps identified numerous areas for improvement including effective use of artillery. A critical component of any successful attack, coordinating the effective use of artillery proved challenging. Often the gap between the cessation of the bombardment and the signal to begin the advance afforded the Germans ample time to emerge from overhead cover and reoccupy their main trench lines. The race across no man's land often ended with the sound of German machine-guns and Canadian dead. Success depended on finding a means to get the assaulting companies and platoons across no man's land before the Germans reoccupied their positions. This led to the adoption of the creeping barrage technique, in which the attacking infantry hugged the falling artillery barrage as it advanced at set intervals towards the German positions. The creeping barrage posed its own danger to the attacking troops. Infantry advancing too close risked injury from their own artillery support, while those who lagged behind still faced the likelihood of death by German machine-gun and artillery fire. Even troops conducting a well-timed advance found themselves more exposed during a creeping barrage to injury or death from friendly rounds falling short. A barrage that moved too fast accomplished little and one that moved too slow simply provided more time for German operational reserves to react to the assault. The challenge lay in finding the right duration of fire.¹⁰¹

¹⁰⁰ Rawling, *Surviving Trench Warfare*, 79; Griffith, *Battle Tactics on the Western Front*, 65-83.

¹⁰¹ Zuehkle, *Brave Battalion*, 129.

The creeping barrage represented a significant shift in the use of artillery. The previous model of infantry-artillery cooperation envisioned the artillery destroying German defenses and the infantry simply occupying what remained. The British Expeditionary Force employed this method during much of the Battle of the Somme and it proved ineffective. By employing the creeping barrage, the artillery supported the infantry's maneuver through no-man's land onto the objective. Once there it remained the infantry's task to destroy enemy forces and occupy their defenses. The Canadians did not invent the creeping barrage—some British units used it to great effect in 1916.¹⁰² They did, however, incorporate the new procedure into every attack once they learned how to employ it. Effective use of the creeping barrage required well-trained troops and iron discipline. Byng ensured both. Once again, Byng and the Corps acted in accordance with the tenets of a learning organization. The British experience on the Somme indicated the validity of the creeping barrage—information the Corps acquired through its own experience and via after-action reports distributed throughout the wider British Army. The Corps then interpreted and disseminated that knowledge throughout the organization and incorporated the creeping barrage as an integral part of its planning process.

The revival of the platoon solved another persistent problem of warfare on the Western Front. In smaller battles and limited raids, the Corps proved that with good artillery planning, it could seize German trench lines. The difficulty always came in holding it against German counter-attacks. Communication between the front line troops and their brigade and division headquarters remained problematic. The constant shellfire quickly severed telephone lines and wireless radios remained fragile, cumbersome, and immobile. The use of signals such as colored rockets or flags often caused confusion, especially in poor weather or the dust of the battlefield. The most reliable means of communication remained runners, but even if a runner survived the

¹⁰² Rawling noted that the British 18th Division used the creeping barrage to great effect on first day of the Battle of the Somme, see Rawling, *Surviving Trench Warfare*, 77.

round trip journey through no man's land, the information contained in the message he carried was often out date by the time it reached the respective headquarters. Lacking a reliable means of communication, the artillery's ability to support the attacking infantry declined significantly after zero hour.

With its Lewis Guns and rifle grenades, the attacking infantry now possessed the firepower to defeat the inevitable German counter-attack. With four Lewis Guns at his immediate disposal, a company commander could quickly establish an interlocking machine-gun screen. Rifle grenades acted as the infantry's own artillery. For its part, the artillery struck the German lines of communications leading to the front thereby disrupting reinforcements and breaking up counter-attacking formations.

These tactical adaptations and adjustments coalesced into the trademark Canadian set-piece attack. Andrew Godfroy described the set piece attack as a "deliberately planned offensive tactic consisting of a deliberate closely timed infantry assault under the cover of an intense rolling barrage against a limited objective."¹⁰³ The set piece attack represented a tangible product of a learning cycle. During the critical period before Vimy, the Corps engaged in a process that closely resembles Garvin's learning cycle elements of interpreting, transferring, and retaining knowledge. As a result, the Corps' preparations to attack Vimy Ridge stressed a combination of detailed planning, rehearsals, artillery preparation, and platoon unit tactics centered on initiative and new weapon systems.

¹⁰³ Andrew B. Godefroy, "The Advent of the Set-Piece Attack. Major-General Arthur Currie and the Battle of Mount Sorrel, 2-13 June 1916," in *Great War Commands: Historical Perspectives on Canadian Army Leadership, 1914-1918*, ed. Andrew B. Godefroy (Kingston, Ontario: Canadian Defence Academy Press, 2010), 2.

Vimy Ridge

The attack on Vimy Ridge marked the first occasion in which all four divisions of the Canadian Corps cooperated in an integrated attack. Byng's plan included meticulous detail and preparation. The Canadians built scale models of the objective behind the lines and each battalion took its turn practicing its specific role for the attack. Byng's plan assigned specific objectives to each echelon down to the platoon level and every man knew his role, the role of his unit and of the units on either side of him. The Corps planned to attack with all four divisions abreast with the veteran 1st Division on the far right and the 4th Division on the far left. The Germans, with their commanding view of the Allied lines, sensed an impending attack. However, they could not determine the timing or, more importantly, whether the Canadians intended to mount a major attack or simply act as a demonstration in support of a larger Allied offensive.¹⁰⁴

In the weeks before the attack, activity against the German lines grew daily. The Canadians steadily increased the frequency and size of raids, as Byng demanded more information on German defenses and sought to shield his own preparations by dominating no man's land. Not all the Canadian raids resulted in success. On March 1, 1917 Major General David Watson's 4th Division launched the largest raid to date using all four infantry battalions of his 12th Brigade. The uniqueness of this raid lay not only in its size but also in the Canadians' use of poison gas. An experienced officer who served as a battalion commander at Ypres, Watson preceded the raid with a gas attack that he believed would clear the German lines. One wonders how Watson could have thought that gas would prove more effective in 1917—against German troops equipped with gas masks—than it had against the Canadians at Ypres. The raid failed miserably. The Germans observed the Canadian preparations and destroyed a number of gas cylinders with artillery fire, causing casualties and confusion amongst the attacking troops. When

¹⁰⁴ Jack Sheldon, *The German Army on Vimy Ridge 1914-1917* (Barnsley: Pen and Sword Press, 2008), 260.

the Canadians did go over the top they encountered intense German fire and sustained heavy losses. The four attacking battalions suffered a total of 687 casualties, or 43% of the attacking force. So many Canadian dead and wounded lay in no man's land that the local German commander proposed a ceasefire to allow for their collection. Despite the progress made under Byng's leadership, the Canadians still had much to learn.¹⁰⁵ Thus, while Byng's preparations indicated that the Corps exercised the tenets of acquiring, interpreting, transferring, and retaining information inherent in a learning organization, Watson's poorly planned raid demonstrated that the Corps remained capable of missteps as it struggled to improve its performance.

Despite this setback, Byng continued with his preparations. With the date of the attack now fixed for April 9, 1917 the Canadians subjected the Germans to a week of intensive artillery fire. The Germans could not move basic supplies of food and water to their front-line troops under such conditions. Each time the guns ceased firing the Germans expecting the attack, rushed to man their positions, only to be relentlessly bombarded again. Casualties, exhaustion, and loss of discipline grew amongst the defending troops who referred to the week before the attack as, "The Week of Suffering."¹⁰⁶

When it finally began, the Canadian assault resulted in a clear and resounding success. In his official history of the Canadian Expeditionary Force, Nicholson summarized both the details of the assault and the conditions that led to its success in the official history, "The operations had resulted in the capture of more ground, more prisoners and more guns than any previous British offensive on the Western Front. The effective use of artillery in unprecedented strength with adequate supplies of ammunition, coupled with the gaining of tactical surprise paid good

¹⁰⁵ Sheldon, *The German Army on Vimy Ridge*, 238-41; Cook, *Shock Troops*, 61-71; Nicholson, *Official History*, 234.

¹⁰⁶ Sheldon, *The German Army on Vimy Ridge*, 268-76.

dividends.”¹⁰⁷ The meticulous preparation, close infantry-artillery cooperation, and platoon tactics against a limited objective that characterized the set-piece attack proved effective. By nightfall on April 9, 1917, most of the ridge lay in Canadian hands, although some stubborn German positions held out until April 12. The set-piece attack, a consolidation of three years of adaptation, accomplished what before had seemed impossible: the capture and retention of strongly held key terrain on the Western Front.¹⁰⁸ With the loss of the ridge, the Germans conducted a general withdrawal to more defensible positions situated far enough away from the ridge as to deny the Canadians any opportunity to exploit their success. Regardless, the Corps could not conduct a rapid exploitation beyond the ridge because it still lacked the ability to reposition artillery quickly over the destroyed landscape of no man’s land attacking the new German defenses without artillery support would invite defeat. They could only move slowly and cautiously down the slope toward the new German defenses.¹⁰⁹

The period between April 9 and 14 cost the Canadian Corps 10,602 casualties, including 3,598 dead—a steep price to pay for what turned out to be only a local success.¹¹⁰ The Battle of Arras, the wider British offensive which included the attack at Vimy Ridge, failed to achieve its objectives partly due to the effective use of new German defensive tactics—methods the defenders did not employ at Vimy.¹¹¹ Furthermore, Nivelle’s French offensives also failed,

¹⁰⁷ Nicholson, *Official History*, 266.

¹⁰⁸ Ian M. Brown, “Not Glamorous, But Effective: The Canadian Corps and the Set-Piece Attack, 1917-1918,” *Journal of Military History* 58, no.3 (July 1994): 421-44 provides a description of the evolution of the set-piece attack in the last two years of the war.

¹⁰⁹ Nicholson, *Official History*, 263.

¹¹⁰ Cook, *Shock Troops*, 143-44.

¹¹¹ See Lupfer, *The Dynamics of Change*, 1-37 for a description of the new German defensive tactics. The loss of Vimy Ridge resulted the removal of the German Sixth Army’s Chief of Staff and Head of Operations for improper implementation of the new German defensive doctrine and for general poor handling of the battle; Sheldon, *The German Army on Vimy Ridge*,

leading to widespread mutinies in the French Army. Vimy Ridge proved the value of the set-piece attack, but more importantly, as Tim Cook pointed out, Vimy marked “the turning point in the war for the Canadian Corps: the point where it moved from an amateur to a professional warfighting force.”¹¹² After Vimy, the Corps never lost a major engagement.

The Battle of Arras continued until mid-May. In the immediate weeks after Vimy, the Canadian Corps fought a number of smaller, limited actions—mostly in support of British offensives including successful brigade-size actions at Arleux on April 28 and Fresnoy on May 3, 1917. Historian Paddy Griffith asserted that the mixed performance of British divisions in these attacks indicated an uneven dissemination of the lessons learned at the Somme. Incidents such as the inability of British troops to retain the village of Fresnoy, captured by the 1st Canadian Brigade on May 3, 1917 only served to highlight the discrepancy between the Canadian Corps and some, but certainly not all, of the British Divisions.¹¹³

While successes such as Vimy, Arleux, and Fresnoy indicated the Corps’ maturation into a truly professional force, the most visible symbol came on June 6, 1917 when Sir Arthur Currie assumed command of the Canadian Corps. Byng, who assumed command of the British Third Army, groomed and mentored Currie for this moment. Since the start of the war, Currie proved himself at every level of command. He did not have to wait long for his first test as a Corps Commander, which occurred in August 1917.

Hill 70 and Passchendaele

Determined to keep the pressure on the Germans, Haig identified his next objective as the clearance of the Belgian coast, intending to eliminate the German U-Boat pens that threatened

328.

¹¹² Cook, *Shock Troops*, 147.

¹¹³ Paddy Griffith, *Battle Tactics of the Western Front: The British Army’s Art of Attack 1916-1918* (New Haven: Yale University Press, 1994), 80.

British trade. By seizing Passchendaele Ridge, Haig believed he could force the Germans to abandon the Channel ports. Haig ordered Currie's Canadian Corps to support his main effort by threatening the town of Lens, thereby creating a diversion and drawing German operational reserves away from the Passchendaele area. Currie's appreciation of the ground led him to determine that the key to Lens lay in the surrounding terrain—especially the dominating high ground designated as Hill 70. In Currie's opinion, a direct assault on Lens risked heavy and needless casualties. By capturing Hill 70, Currie could either force the Germans to withdraw from Lens or at least provide better support should an assault on the town become necessary. However, he felt that Hill 70's importance would force the Germans to fight for it. Currie demanded a change to his orders and his diary entry on July 10, 1917 noted, "To Army conference where plans are slightly changed. I ask to take Hill 70. This is agreed to and 1st Division is to move at once."¹¹⁴ The fact that Currie would demand a change to his orders shows the degree to which his self-confidence had grown. His superiors' acquiescence shows their faith in Currie's ability and judgment—his superiors shared his own confidence in his leadership and his Corps' effectiveness. His request approved, Currie focused his efforts on taking Hill 70.¹¹⁵

Currie once again displayed his penchant for detailed planning and preparation, which had proved its value in previous battles—especially Vimy Ridge and Mount Sorrel. Currie's incorporation of meticulous planning in each of the Corps' subsequent engagements demonstrated the retention of lessons learned at Vimy and Mount Sorrel. The battle for Hill 70 began on August 15, 1917 with attacks by the 1st and 2nd Divisions, commanding between them nine infantry brigades advancing behind a well-planned and executed rolling barrage. Currie

¹¹⁴ Sir Arthur Currie, *The Selected Papers of Sir Arthur Currie: Diaries, Letters and Report to the Ministry, 1917-1918*, ed. Mark Osborne Humphries (Waterloo, Wilfred Laurier Press, 2008), 46.

¹¹⁵ Nicholson, *Official History*, 284-87. Cook, *Shock Troops*, 264-68.

planned to deal with the expected German counter-attacks by pushing forward forty-eight heavy machine guns per brigade, and forming platoon strongpoints rather than occupying a fixed defensive line. It took Currie's well-trained troops only two hours to seize Hill 70. Between August 15 and 18, 1917, four different German divisions conducted a total of twenty-one counter-attacks, but well-planned artillery and machine-gun fire smashed each one. Currie's diary entry for the period reveals his satisfaction: "Our casualties so far about 5,600 but in my opinion the enemy casualties must be close to 20,000. Our gunners, machine gunners, and infantry never had such targets. Forward Observation Officers could not get guns for all their targets."¹¹⁶ Subsequent Canadian attacks on August 21 and 25 further secured the Corps' positions. Hill 70 marked Currie's first action as a corps commander and in it he demonstrated his effectiveness as an innovative commander capable of independent action. From that point forward, Haig placed the Canadian Corps wherever he needed an iron fist.¹¹⁷

After some initial success, Haig's main effort, the seizure of Passchendaele Ridge quickly turned into a fiasco. The wider offensive began on July 31, 1917 but after four weeks of fighting it had gained little at the cost 68,000 casualties.¹¹⁸ After pausing for three weeks, the offensive resumed, but with the same effect—some minor success but, as Nicholson noted, "Objectives that were to be captured on July 31, the opening day of the offensive, were still untaken."¹¹⁹ By early October, the weather worsened; steady rain turned the Passchendaele battlefield into an impassable morass of mud. Up to this point, the capture of Hill 70 marked the only Canadian contribution to Haig's Passchendaele offensive. However, fifty-one out of sixty British divisions

¹¹⁶ Currie, *Selected Papers*, 48.

¹¹⁷ Nicholson, *Official History*, 289-92.

¹¹⁸ Nicholson, *Official History*, 308.

¹¹⁹ Nicholson, *Official History*, 311.

on the Western Front cycled through Flanders as part of Haig's offensive, after which he turned to the Canadian Corps for combat power to commit to the operation.¹²⁰

Currie's first indication of a possible move to the Passchendaele front came on October 3, 1917 and he recorded in his diary, "Informed two divisions were to be withdrawn. Might go north."¹²¹ Currie knew that going north meant Passchendaele, and he disagreed with Haig regarding the importance of Passchendaele, convinced that the cost of winning the battle outweighed the potential benefit. Currie's unique position as a semi-independent Corps responsible to the Canadian government as well as the British chain of command gave him a unique position to challenge Haig. Currie agreed to send the Corps would go to Passchendaele only under certain conditions. Currie demanded additional artillery and time to prepare his troops, and he refused to serve under British General Henry Gough, commander of the Fifth Army, whom Currie considered incompetent.¹²²

In a grim reminder of the static nature of the Western Front, the Canadian Corps entered the line on October 18, 1917, occupying trenches in the same terrain where the 1st Division fought in April 1915. Currie stated, "The battlefield looks bad" and noted the terrible condition of the terrain and the large numbers of Australian dead that still lay in no man's land.¹²³ In accordance with Currie's now well-established style, he refused to rush to failure, insisting on time to prepare the Corps. Haig made good on his promise for additional artillery and Currie prioritized the repair of the road network behind the Canadian trenches in order to enable the forward movement of the guns, ammunition, and other supplies. Concurrently, the Corps engaged

¹²⁰ Cook, *Shock Troops*, 316

¹²¹ Currie, *Selected Papers*, 51.

¹²² Nicholson, *Official History*, 312; Cook, *Storm Troops*, 317; Currie *Selected Papers*, 52.

¹²³ Currie, *Selected Papers*, 54.

in a systematic intelligence collection effort while the assaulting divisions rehearsed for the upcoming attack.¹²⁴ That the Corps could now prepare for a deliberate attack on a prepared German position in a matter of weeks rather than the months required for Vimy indicated the growing professionalism of Currie's staff.

Beginning on October 26, 1917 Currie launched four consecutive attacks, each with a specific but limited aim and supported with ample artillery. Currie carefully selected the objectives for each attack knowing that the Germans would inevitably counterattack anywhere the Canadians achieved success. To extend the Corps too far risked losing any gains with the possible result of another bloody and indecisive battle. The 3rd and 4th Divisions attacked first and succeeded in capturing key terrain necessary for a subsequent attack, which the same divisions carried out on October 30. Despite Currie's meticulous planning the attacking divisions suffered high casualties, but they achieved their objectives. With the success of the October 30 attack, the conditions existed for the 1st and 2nd Divisions to capture Passchendaele village. This attack began on November 6, 1917 with a corps-level barrage. The attacking infantry crossed no man's land so quickly that the German defensive barrage landed well behind them.¹²⁵ The attackers quickly captured the village. Only a small portion of the ridge remained in German hands; Currie completed his successful offensive by eliminating this lingering resistance in a hard-fought brigade operation on November 10, 1917.¹²⁶

The Corps operations at Passchendaele once again proved the value of the platoon tactics and junior leadership perfected at Vimy. For his part, Currie could prepare the troops for the

¹²⁴ Cook, *Shock Troops*, 325-26; Nicholson *Official History*, 313.

¹²⁵ Nicholson, *Official History*, 324.

¹²⁶ Nicholson, *Official History*, 318-27; Cook, *Shock Troops*, 309-66; Rawling, *Surviving Trench Warfare*, 143-66.

assault but once the fire plan started and the troops left the trenches he relied on the professionalism and dedication of his troops and subordinate leaders. Tim Cook noted, “The decentralization of command emphasized in training during the winter of 1916-1917 had become fully ingrained in the Canadian Corps.”¹²⁷ The Corps had fully interpreted, transferred, and retained the lessons learned from the Somme and applied those lessons to change its behavior. Achieving what several other British Army organizations had failed to do during the winter of 1916-1917 the Corps seized Passchendaele by employing the full range of techniques it had learned in the preceding years, demonstrating its successful transformation into a learning organization. The success at Passchendaele cost the Corps over 15,000 casualties, but once again tactical and operational success did not translate into strategic success. Haig’s objectives remained unfulfilled.¹²⁸

After Passchendaele, the Canadians considered themselves amongst the best troops in the British Army—a phenomenon they would have viewed as unthinkable in 1915. Currie viewed the performance of most British units as inferior to that of the Canadian Corps. Throughout the campaign, he recorded his dissatisfaction with a number of British units. For instance, after the second attack on October 30 he recorded in his diary that, “Imperials on flank failed again as they did on the 26th,” and in a letter of the same day to Lieutenant General Sir Richard Turner he wrote, “as usual the flanks are giving us trouble.” Finally, on November 10, after the fourth and final attack, he remarked that the British 3rd Brigade “retired in a very bad and pronounced disorder, amounting to a panic. They came back to their original line.”¹²⁹ Such observations illustrate that by the end of 1917, the Canadian Corps had emerged as an exceptional formation.

¹²⁷ Cook, *Shock Troops*, 355.

¹²⁸ Nicholson, *Official History*, 327.

¹²⁹ Currie, *Selected Papers*, 55-58.

Currie took pride in the Corps' growing reputation within the British Army and ensured that Canadians at home also knew of its accomplishments. On November 14, 1917 he summarized the Corps' accomplishments at Passchendaele in a letter to Ontario Premier Sir William Hearst. "We were brought to this part of the battlefield for a special purpose. It was absolutely necessary to gain certain ground, and in order to make sure of it the Commander-in-Chief sent for the Canadians. We have successfully accomplished the task assigned to us." In the same letter, Currie recounted the string of successes enjoyed by the Corps in 1917 including Vimy, Hill 70, and Passchendaele, further evidence that the Canadian Corps had achieved an elite status among the British Army's forces. "We have taken every objective from the enemy we started for and have not had a single reverse....I know that no other Corps has the same unbroken series of successes. All this testifies to the discipline, training, leadership, and fine fighting qualities of the Canadians." Currie only regretted the casualties.¹³⁰

Passchendaele marked the end of major combat operations in 1917 and much like the previous winter, Currie intended to take full advantage of the relative lull to prepare for the coming year. This winter, however, he and the Corps faced a new set of challenges. The strain of near-constant offensive operations and the 15,000 casualties suffered at Passchendaele alone had significantly degraded morale by the end of 1917. Historian Tim Cook revealed that many soldiers thought Currie too eager to volunteer the Corps for operations such as Passchendaele. Some soldiers referred to Currie as a "butcher" intent on using the Corps to enhance his own reputation.¹³¹

Manpower presented another significant issue. Cook placed the strength of the Canadian Corps in January 1918 at 139,915 personnel, yet the Corps' total casualties since 1915 amounted

¹³⁰ Currie, *Selected Papers*, 59.

¹³¹ Cook, *Shock Troops*, 367-68.

to 147,000 and operations such as Hill 70 and Passchendaele indicated that casualty rates would likely increase.¹³² The British, also facing a manpower crisis, could not keep divisions on the Western Front at their authorized strength. The British decided to reduce the number of infantry battalions in each division from twelve to nine, breaking up a number of battalions in the process and distributing the troops across the remaining formations of the British Army. The British suggested that the Canadians match this new structure and, when combined with the 5th Canadian Division soon to complete training in England, create a multi-corps Canadian Army. Currie flatly refused to entertain such an idea. In doing so he turned down the opportunity for promotion and Army command.¹³³

In Currie's mind, the success of the Canadian Corps stemmed from its ability to concentrate men and material at the critical time and place. To dilute the Corps along the new British model eliminated that advantage. In a lengthy letter to Sir Edward Kemp, the Canadian Minister of Overseas Forces, Currie made a strong argument against the proposed reorganization: "The Canadian Corps has proved itself to be an effective and smoothly working fighting machine. To alter its constitution would be to run a very great risk of reducing the striking value of the force with no compensating advantages."¹³⁴ Instead, Currie gained Kemp's support to take the opposite approach.

Currie collapsed the 5th Division, enlarging the infantry battalions of the other four divisions beyond their authorized strength, and significantly increased the strength of division and corps enablers such as engineers, transportation, and fire support including machine-gun and artillery. Currie's sought with this approach to add a quantitative edge to the Corps' already significant qualitative advantage. This resulted in organization of the Canadian Corps of in four

¹³² Cook, *Shock Troops*, 368-69.

¹³³ Cook, *Shock Troops*, 372-73.

¹³⁴ Currie, *Selected Papers*, 81.

divisions, each with twelve oversized infantry battalions. As a result, each Canadian division had an infantry strength of 12,000 men, versus only 8,000 in a British division. Currie also added to each division an engineer brigade and a machine-gun battalion three times the size of a comparable British machine-gun battalion. Additional trench mortar battalions and motor transport companies resulted in a Canadian division of 21,000 men; much larger than the new 15,000-man British division. The amount of artillery available to the Corps also grew. In addition to the standard two artillery brigades per division, the Corps level artillery absorbed the 5th division's guns, resulting in a significantly larger artillery capacity, all under the control of the Corps' senior artillery officer. Rather than following the British practice of simply offering advice to the Corps commander, in the Canadian Corps the senior artillery officer commanded each gun, including those nominally under the control of the divisions. This allowed for the effective use of each gun in the Corps, particularly by massing fires, which enhanced its already highly efficient counter-battery capability and enabled it to employ overwhelming firepower at critical points in an operation. By conducting this reorganization, Currie formed a self-contained, powerful, and highly experienced organization for the upcoming battles of 1918.¹³⁵

As Currie reorganized the Corps, other events indicated that 1918 could be the decisive year of the war. With Russia out of the war, the Germans could concentrate their efforts on the Western Front. Further, the build-up of American troops would eventually tip the balance in the Allies' favor, but not until the fall of 1918. Thus, the Germans identified a window of opportunity beginning in the spring of that year during which it could strike a significant blow to the Allies. The Allies expected a German offensive, but they did not know where or when it would come.¹³⁶

¹³⁵ Shane B. Schreiber, *Shock Army of the British Empire: The Canadian Corps in the Last 100 Days of the Great War* (Westport, CT: Greenwood Publishing Group, 1997), 19-24; Cook, *Shock Troops*, 373-78; Nicholson *Official History*, 383.

¹³⁶ Tim Travers, *How the War Was Won: Command and Technology in the British Army on the Western Front 1917-1918* (New York: Routledge, 1992), 50-54.

After Passchendaele, the Corps occupied defensive positions near Vimy, the scene of the great victory of April 1917, and settled into a routine of constructing defenses, training, and keeping up activity by conducting regular raids against the German trenches while waiting for the impending German attack. By March 1918, the tension had grown significantly—Currie expected the German offensive to begin soon. Currie recorded in his diary entry of March 11, 1918, “It is thought the coming German offensive will begin in a few days.” Two days later in a letter to Minister Kemp, Currie recounted the results of a successful trench raid and commented “In these days when everyone is on tip-toe expecting the German offensive to begin, it is most important to get prisoners and thereby keep in touch with what your enemy is doing and planning.”¹³⁷ However, the Corps’ formidable defensive positions on Vimy Ridge spared it from the German offensive.

The expected German assault began on March 21, 1918 but did not strike the Canadian Corps, falling instead to the south of the Vimy positions and squarely upon Byng’s Third and Gough’s Fifth Armies. The Germans spearheaded their assault with newly formed elite units that attacked in small groups, preferring infiltration and envelopments to frontal assaults. These “stormtroops” caused havoc within the British lines and the Germans made gains, pushing the British back twenty kilometers and regaining control of Passchendaele Ridge.¹³⁸ Haig pulled three of Currie’s divisions to support the retreating British but Currie immediately pushed back against the Commander-in-Chief. Currie stated that unlike other Corps of the British Army, the Canadian Corps must remain intact as a cohesive fighting unit. To break it up piecemeal had both political and military costs. On March 27, in a letter to Haig’s Chief of Staff, Currie hinted at the possible political ramifications of Haig’s policy. “The units of the Canadian Corps are most

¹³⁷ Currie, *Selected Papers*, 86-87.

¹³⁸ Gudmundsson, *Stormtroop Tactics*, 155-70.

anxious to fight side by side, and I am sure the people of Canada wish it so.” As for the military implications, “I cannot help but point out that the best will be got out of the Corps if it fights as a unit, and now of all times we want to get the best out of everybody and every organization.”¹³⁹

Once again, Currie used his position as a semi-national contingent commander to the fullest. Currie correctly pointed out the Corps’ most significant advantage—its homogeneity. To break up the Corps would destroy its cohesiveness and make it extremely difficult to gain and apply additional lessons learned. As the German offensive rumbled on into April, the Canadian Corps took over more and more of the British line, holding one-fifth of the BEF’s total frontage by mid-April but it remained although it remained uncommitted.¹⁴⁰ Relations between Currie and Haig soured and Haig felt that unlike their Australian cousins the Canadians did not pull their weight at a critical time. Haig recorded his frustration with Currie in his diary on April 18, “He wishes to fight only as a “Canadian Corps” and get his Canadian representative in London to write and urge me to arrange it! As a result, the Canadians are together holding a wide front near Arras, but they have not yet been in the battle!”¹⁴¹ For Haig the inability to use one of his most powerful formations must have been a frustrating ordeal.

The Hundred Days

The German offensive slowly lost momentum and a French and American counter-attack from July 15 to August 6, 1918 along the Marne River signaled its end. The Allies wavered but did not break and the rapid build-up of American troops began to tip the scales. The German offensive forced upon the Allies the need for a single commander to coordinate Allied actions across the front. French General Ferdinand Foch assumed the role of Commander-in-Chief of the

¹³⁹ Currie, *Selected Papers*, 91.

¹⁴⁰ Cook, *Shock Troops*, 386.

¹⁴¹ Sir Douglas Haig quoted in Nicholson, *Official History*, 380.

Allied Armies on March 26, 1918. With the Allied success at the Battle of the Marne, Foch now pushed for a general counter-offensive. Foch proposed three offensives to drive the Germans back and free key lines of communication: a continuation of the Marne counter-attack, a French-British offensive at Amiens scheduled to begin on August 10, and a French-American offensive near St. Mihiel to start soon after the Amiens offensive. Foch wanted each of these attacks to commence in rapid succession to keep up steady pressure on the German army.¹⁴²

The Germans had come to regard the Canadians as first-rate troops and they knew that their position on the Western Front often indicated possible British offensives. Moving the Corps into position near Amiens therefore called for speed and secrecy. British General Henry Rawlinson's Fourth Army planned most of the Amiens offensive and unlike Passchendaele Currie had little influence. In fact, Haig did not inform Currie of the offensive or the intent to use his corps until July 20, three weeks before the scheduled offensive and only one day before the key planning conference. Rawlinson's plan called for the Canadian and Australian Corps, supported by the newly formed Royal Tank Corps, to seize the former British defensive positions that lay six to ten miles behind the German front line. The British Third Corps and French First Army protected the Canadian and Australian flanks and light tanks and cavalry prepared to exploit any breakthrough. At the planning conference on July 21, Currie suggested that the Canadian Corps continue its preparations for a limited attack in its current area of the line. This would serve the dual purpose of deceiving not only the Germans but also his own troops as well, thereby retaining a degree of secrecy. Since Rawlinson's plan called for the intimate use of tanks, Currie arranged to send a number of his officers to the Australian training school to learn the latest tank-infantry tactics. The Canadians had limited experience with tanks, while the Australians had employed

¹⁴² Nicholson, *Official History*, 386.

them to great success on July 4, 1918, at the Battle of Hamel, where they learned many lessons they could share with their allies.¹⁴³

To support his deception plan, Currie dispatched two battalions, one each from the 2nd and 3rd Divisions, to the British Second Army's sector in Belgium. There they conducted trench raids, deliberately losing easily identifiable pieces of equipment, to convince the Germans of a Canadian move into this part of the line. Currie also sent signals units to create false messaging traffic and moved two casualty-clearing stations for good measure.¹⁴⁴ Meanwhile, the Corps pulled out of the line and into reserve where it continued training for the Currie's false attack. Currie did not inform his division commanders until July 29 of the Amiens plan but forbid them from informing their brigade commanders. This left only one day for the Corps' administrative staff to plan the movement of the entire corps and only nine days to complete it. By limiting movement to nighttime, and only under the strictest secrecy, the Corps concentrated at Amiens rapidly without alerting the Germans. This demonstrates the level of professionalism of the Corp's administrative staff at this point in the war.¹⁴⁵

Currie planned a simple three-division attack with a fourth in reserve to exploit success. Attachments to the Corps included the British 3rd Cavalry Division, the 4th Tank Brigade, and a Royal Air Force squadron. In his 1918 "Report to the Ministry," Currie described the general scheme of maneuver for the attack. The Corps planned to "overrun rapidly the enemy's forward area...under cover of a dense artillery barrage...relying on tanks to overcome the machine-gun defences." The cavalry would then push through followed by remaining infantry division to seize follow-on objectives. The Australians on the left and the French on the right coordinated their attacks with the Canadians since as Currie pointed out, "The Canadian Corps being, as it were,

¹⁴³ Currie, *Selected Papers*, 244.

¹⁴⁴ Currie, *Selected Papers*, 246.

¹⁴⁵ Nicholson, *Official History*, 390.

the spearhead of the attack the movements of the other formations were to be synchronised with ours.” To keep in contact with the French on his right, Currie formed an *ad hoc* organization consisting of Brigadier General Brutinel’s motor machine gun brigade and the Corps cyclist battalion.¹⁴⁶ Currie’s simple fire plan consisted of a rolling barrage and a well-planned counter-battery scheme to destroy most of the German artillery in the opening minutes of the attack. However, as Passchendaele proved, even the best-orchestrated fire plan could not destroy all the German wire, pillboxes, and machine-gun positions. To assist the infantry in eliminating these defenses each attacking division received a battalion of thirty-six tanks.¹⁴⁷

The attack began on August 8 with a massive barrage. Remarkably, the final units of the Corps reached their attack positions only twenty minutes before the barrage began another testament to the administrative quality of the Corps staff. The Canadians advanced as they had at Passchendaele. Platoon-size units, led by junior leaders who systematically located, surrounded, and then destroyed any point of resistance with a combination of Lewis guns, rifle grenades, and light mortars. By early afternoon, both the Australians and Canadians secured their initial objectives and ripped a large gap in the German line. In the Canadian sector, powerful attacks disintegrated the forward German divisions and pushed the German lines back eight miles. On the Australian left, the British advanced two miles and the French on the Canadian right advanced five miles. Nicholson in the Corps official history recorded German casualties of 27,000 men and more than 400 guns. The Allies lost approximately 8,800 casualties including 3,868 Canadian troops. Amiens was a devastating blow to the German Army; Ludendorff described it as “the black day of the German Army.”¹⁴⁸ Rawlinson’s ability to conduct such a well-coordinated attack

¹⁴⁶ Currie, *Selected Papers*, 255.

¹⁴⁷ Cook, *Sharp End*, 411-18.

¹⁴⁸ Nicholson, *Official History*, 407.

and the German Army's inability to stage a proper defense or to coordinate a response demonstrated the declining quality of the German Army.¹⁴⁹

Confusing and poorly coordinated attempts by the Allies to exploit their initial successes followed on August 9 and 10. Despite some limited additional gains, they lacked the ability to maintain the tempo achieved on the first day of the battle. Foch urged Haig to continue the advance but to the Corps commanders such as Currie the additional casualties did not justify the paltry gains. In a letter to Sir Edward Kemp on August 15 Currie recalled, "I may say it was intended that we should go on, but on a thorough examination of what confronted us I decided that to attempt an advance at the present time would cost enormous casualties, and so I advised against making any further advances now."¹⁵⁰ Currie presented a lucid argument to Rawlinson recommending an end to the Amiens offensive. Historian Tim Travers found that the decision to call off the Amiens offensive went from "Currie to Rawlinson to Haig to Foch, showing that as in 1916 and 1917, the further the commander was from the battlefield the less grasp he had of reality."¹⁵¹ However, by 1918 leaders such as Haig were more open to the suggestions and opinions of their subordinate commanders.

Haig intended to follow the success at Amiens with "a simple, straightforward advance by all troops on all fronts to keep the enemy on the move."¹⁵² The Allies wanted to finish the war in 1918 but the Germans had the advantage of the formidable Hindenburg Line, a well-established defensive position built in the winter of 1916 to 1917. Furthermore, the Allies had

¹⁴⁹ Cook, *Sharp End*, 419-36.

¹⁵⁰ Currie, *Selected Papers*, 104.

¹⁵¹ Tim Travers, *How The War Was Won*, 131; Nicholson, *Official History*, 422-23.

¹⁵² Haig, quoted in Schreiber *Shock Army*, 70.

perhaps three good months of campaigning left in 1918. Nevertheless, the Allies agreed to maintain the pressure on the German Army and deny it the opportunity to reorganize.¹⁵³

Haig assigned the Canadian Corps the role of supporting the general advance by cracking the Drocourt-Queant line—a position described by Nicholson in the Corps official history as “the hinge of the Hindenburg system”—thereby opening the road to the railway center at Cambrai.¹⁵⁴ Currie had even less time to prepare for this assault than any previous attack. Once again, the Corps changed parent organizations shifting from the Fourth Army to the First Army. Currie only issued orders to his division commanders a mere three days before the scheduled attack.

Unlike Amiens, the attack on the Drocourt-Queant provided no possibility of deceiving the enemy and moving the Corps into their positions required speed not stealth. Currie could only plan on the 2nd and 3rd Divisions as the 1st and 4th Divisions would not arrive in time, but he did have the excellent British 51st Division in reserve. Currie’s plan called for a night attack, a decision that caused much anxiety at both First Army and with Haig himself. Haig visited Currie’s headquarters to express his concerns and when Currie asked for another twenty-four hours to prepare, Haig quickly agreed. Currie recorded that he wanted “to take advantage of the restricted visibility...so to effect a surprise; the attacking troops would thus pass through the enemy’s forward machine-gun defences by infiltration and be in a position to assault at dawn his line of resistance.”¹⁵⁵ Currie’s infiltration plan yielded tremendous results and the Corps seized the forward German defensive positions by early morning of August 26. However, as at Amiens, the Corps’ rapid success caused problems. As the 2nd and 3rd Divisions attempted to consolidate, the Germans launched a number of counter-attacks and subjected the lead troops to intense artillery fire from guns that fired from sites beyond the range of the Corps’ counter-battery assets.

¹⁵³ Zuehlke, *Brave Battalion*, 211 provides a description of the Hindenburg Line.

¹⁵⁴ Nicholson, *Official History*, 426.

¹⁵⁵ Currie, *Selected Papers*, 264.

Currie's insistence on a night attack indicated that he acknowledged the risk of attacking without the normal preparation period and sought to compensate for it through surprise.

Currie ordered the attacks the next day but these attacks suffered from disorganization and a lack coordination. The Germans rushed reinforcements into the area having quickly realized the importance of retaining their defenses. The 1st Division and the British 4th Division were available for use on August 28, but the British arrived late and Currie felt there was not enough time to properly integrate them into the Corps structure. Rather than replace only one the attacking divisions Currie chose to continue attacking with the 2nd and 3rd Divisions and they suffered heavy casualties. Shane Schreiber asserted that Currie made "a rare mistake, for he had underestimated both the ferocity with which the Germans were defending, and the exhaustion of his assaulting divisions."¹⁵⁶ Only on August 29 did Currie relieve the 2nd and 3rd Divisions.

The Corps' initial attack lacked all the characteristics of the set-piece attack that had yielded such great success in the past. It suffered from little preparation, lack of rehearsals, and uncoordinated use of artillery. Furthermore, the decision to attack with only half the Corps removed its shock value. Whereas Currie's superiors pressured him to conduct the attack quickly, he had set the precedent earlier of successfully demanding additional preparation time. Perhaps the Corps' performance at Amiens made Currie overconfident that he could find success again, but it eluded him in this instance and his men paid the price. Currie's diary entry on August 28 simply records "The losses were quite heavy today."¹⁵⁷ Currie halted the uncoordinated attacks of the 2nd and 3rd Divisions and turned to what the Corps did best, the set-piece attack.

Having relieved the 2nd and 3rd Divisions, Currie conducted only limited attacks on August 30 and 31, in which the Canadian 1st and British 4th Divisions improved the Corps

¹⁵⁶ Schreiber, *Shock Army*, 76.

¹⁵⁷ Currie, *Selected Papers*, 111.

position for a coordinated attack. Originally planned for September 1, Currie delayed it by a day to refine the plan and improve the attack's chance of success. The plan for the September 2 attack resembled the attack at Amiens. Three divisions, the Canadian 1st and 4th, and the British 4th, supported by 50 tanks, attacked on a concentrated front, supported by a massive rolling barrage and a much improved counter-battery plan. However, unlike Amiens, the attackers lacked the advantage of surprise and faced a well-prepared German position. In the event of a breakthrough, Brutinel's innovative Independent Force had orders to seize the crossings over the Canal du Nord, another formidable obstacle beyond the Hindenburg Line. The attempt to seize both the Drocourt-Queant line and the Canal du Nord in one attack proved too ambitious.¹⁵⁸

The set-piece attack on September 2 resulted in both a tactical and a strategic success. Following a well-planned artillery barrage, the 1st Division secured its objectives and outflanked the German positions. With the Drocourt-Queant line breached, Ludendorff ordered a general withdrawal of six armies behind the Canal du Nord, giving up all the territory seized during the spring offensive.¹⁵⁹ Currie's old 1st Division performed admirably, which he recorded in his diary: "I regard the performance of this division since it took over the line on August 29th as one of the finest performances in all the war."¹⁶⁰ However, the remainder of the Corps did not perform as well. The 4th Division's attack stalled after it advanced beyond the range of its supporting artillery, communication across the front broke down once again, and many of the attacking brigades became intermixed and confused. Only after the 1st Division outflanked the German defenders opposing the 4th Division did they withdraw. Brutinel's innovative mobile

¹⁵⁸ Nicholson, *Official History*, 435-36.

¹⁵⁹ Schreiber, *Shock Army*, 83.

¹⁶⁰ Currie, *Selected Papers*, 115.

force, tasked to seize the crossings over the Canal du Nord, achieved little and the Germans destroyed the crossings unhindered.¹⁶¹

The Canal du Nord presented yet another daunting obstacle. Breaching the canal required detailed planning and enormous resources—particularly engineering equipment. Currie needed to repair the shattered road network to enable the stockpiling of ammunition and engineer resources but, most importantly, he needed to replenish his depleted infantry battalions. Operations on the Drocourt-Queant line cost the Corps 11,400 casualties. The infantry battalions suffered the greatest, with many now below 50% strength.¹⁶²

When the Canadian set-piece attack encountered the new German defense in depth implemented before Vimy and interesting dynamic emerged—the tendency to achieve breakthrough, at least the initial line of defense. This led to increasingly frequent occurrences of fighting on the move, with the defenders forced out of their trenches and strongpoints (a type of fighting referred to by the Americans as open warfare). However, the Drocourt-Queant operation proved that the Corps could not exploit it. For instance, the advancing infantry troops routinely outpaced their supporting artillerymen, who lacked both the technical skill and mental agility to keep up. Brigadier General Griesbach, commander of the 1st Brigade wrote in his after action report following Drocourt-Queant, “Trench warfare ideas still apparently prevail and our artillery have not yet to any extent got into action over open sights at targets of opportunity.”¹⁶³ The Corps continued to struggle with the problem of maintaining communication during the attack. The increased use of tanks led to the destruction of the communication wire laid by the attacking battalions and new methods such as wireless proved unreliable. Furthermore, the rapid pace of

¹⁶¹ Nicholson, *Official History*, 436-40. Cook, *Shock Troops*, 483-99.

¹⁶² Schreiber, *Shock Army*, 88.

¹⁶³ Griesbach quoted in Travers, *How the War was Won*, 151.

operations prevented the detailed rehearsals that facilitated initiative amongst all ranks in achieving the objective even in the absence of company or platoon leadership.

The Corps' analysis of these issues indicated that the problem lay with the speed of the advance. If the infantry advanced too quickly, they outpaced their fire support, leaving the attacking troops at the mercy of German machine-guns. The solution included implementing a four- to six-hour pause between the set-piece attack and the exploitation. This pause allowed the artillery to move forward and synchronize its effects, but it also provided the Germans time to shift reinforcements. However, as Schreiber pointed out, the attacker decided when and where to pause, not the defender. Schreiber also revealed that this recommendation originated simultaneously amongst a number of brigade commanders and quickly found its way to Currie's headquarters.¹⁶⁴ This demonstrated that the Corps possessed an organizational culture that encouraged changes and recommendations from below.

The German general withdrawal to the Hindenburg Line set the conditions for the next phase of Allied offensives on the Western Front. Cracking the Hindenburg Line, Germany's final defensive position, meant possibly ending the war in 1918; however, an Allied defeat in this critical operation would likely extend the war into 1919, giving the Germans time to reconstitute and construct new defenses. The overall Allied strategy remained to subject the German Army to a rapid series of attacks synchronized to draw German strategic reserves to one sector of the front before striking the decisive blow elsewhere. Haig's plan called for Byng's Third Army to strike the decisive blow and penetrate the Hindenburg Line. Securing Byng's left flank meant capturing the German logistical hub at Cambrai. This would hamper German efforts to shift resources along

¹⁶⁴ Schreiber, *Shock Army*, 91-92.

the front in response to Byng's advance. Haig assigned this task to Currie's tired and depleted Canadian Corps—but between the Corps and Cambrai lay the Canal du Nord.¹⁶⁵

The attack on the Canal du Nord resembled the set-piece attack rather than the quick attacks used to penetrate the Drocourt-Queant line. Currie began his logistical preparations and intelligence gathering immediately following Drocourt-Queant although he did not formally receive orders to cross the canal until September 15. Currie's corps would attack the canal on September 27, which meant the Canadians had twelve days to prepare. To assist the Corps, Haig reinforced Currie's troops with the British 11th Division and an understrength tank battalion possessing only twenty-eight tanks. The Corps developed a detailed intelligence appreciation of the canal. In his report to the Ministry Currie described the difficulty in breaching the canal.

The attack was fraught with difficulties...The Corps had...to cross the Canal du Nord on a front of 2,600 yards and to expand later fanwise in a northeasterly direction to a front exceeding 15,000 yards. This intricate manoeuvre called for the most skillful leadership on the part of commanders, and the highest state of discipline on the part of the troops.¹⁶⁶

Currie's plan called for a turning movement, a complicated and risky maneuver, especially given the poor communication methods available. Such an attack demanded close coordination amongst all the elements of the Corps. General Horne, Commanding the British First Army and Currie's nominal superior opposed the plan, but Haig supported Currie. Horne tried again to cancel the operation as planned by inviting Byng, Currie's mentor, to review the plan. Byng also had grave reservations and cautioned Currie, "Do you realize that you are attempting one of the most difficult operations of the war? If anybody can do it, the Canadians can do it, but if you fail, it

¹⁶⁵ Travers, *How the War was Won*, 157.

¹⁶⁶ Currie, *Selected Papers*, 276.

means home for you.”¹⁶⁷ Currie held firm; the attack would go in as planned. In fact, Currie had very little choice as the other option, a direct frontal assault, would yield unacceptable casualties.

Currie’s plan broke the operation into two simple yet distinct phases. The first phase included the crossing of the canal and the seizure of key terrain on the far side. The second phase consisted of the capture of the crossings over a subsequent, smaller canal along with the terrain that controlled the approaches to Cambrai.¹⁶⁸ The leading divisions would advance as far as possible, stopping once the availability of artillery declined and German resistance stiffened. At that point, the divisions would prepare for another set-piece attack the following day. Currie did not attempt to predict when and where each commander would stop, leaving that decision to his subordinate commanders. Currie wished to prevent a recurrence of Drocourt-Queant, where the lead divisions paid a heavy price for attempting to continue the advance without adequate artillery support.¹⁶⁹

Currie’s earlier reorganization of the Corps’ engineer resources now paid dividends. No other British Corps possessed the amount of engineer resources as the Canadians did, and Currie further augmented them by placing the British 11th Division’s engineers directly under the command of his Corps engineer with orders to establish nine crossings over the canal. Currie also placed almost all of the artillery supporting the operation under the direct control of the Corps, ensuring close coordination of fire support, while foregoing any lengthy preparatory bombardment of German positions.¹⁷⁰

¹⁶⁷ Byng, quoted in Schreiber, *Shock Army*, 98.

¹⁶⁸ This was the Canal de l’Escaut, a less daunting obstacle than the Canal du Nord.

¹⁶⁹ Nicholson, *Official History*, 440-45; Cook, *Shock Troops*, 501-8; Schreiber, *Shock Army*, 87-95.

¹⁷⁰ Schreiber, *Shock Army*, 102; Nicholson, *Official History*, 444.

The Corps attacked on September 27, 1918. Once again, a massive artillery barrage stunned the German defenders and a thick rolling barrage covered the leading infantry and engineers. By noon, the engineers accomplished the impossible and the infantry crossed the canal and advanced on Cambrai. Some units advanced as far as eight kilometers, but by nightfall they outpaced their artillery and the advanced stalled. The following day the engineers completed the heavier canal crossings, including the artillery, but the Germans reacted quickly and rushed reinforcements into the gap. The next three days of heavy fighting for Cambrai followed the same pattern. Each night the Corps quickly planned for a set-piece attack at daybreak supported by as much artillery as possible. These attacks generally yielded some success, but as the day wore on the advance slowed, the Germans counter-attacked, and the artillery became less coordinated. After calling a halt for the day, the next day the cycle repeated itself. Each day the Corps moved closer to Cambrai, but the casualties mounted as the gains steadily diminished.¹⁷¹

The Corps experienced little activity the following week, but on October 6 Haig ordered another attempt on Cambrai. The combined effects of multiple Allied offensives across the length of the Western Front forced the Germans to withdraw across the length and breadth of the front. Haig's plan called for the Corps to take Cambrai in support of a larger operation by Byng's Third Army, situated on the Canadian right flank. Byng launched his attack on October 8 and the Canadians launched a night attack with two divisions in the early morning hours of October 9. Facing only German rear guards, the Canadians advanced quickly. Despite some episodes of hard fighting the attack succeeded. The 3rd Division liberated Cambrai on October 10, but an attempt by Brutinel's Independent Force and the Corps Cavalry brigade to exploit the German withdrawal and seize key terrain beyond Cambrai met with stiff resistance. Although mobile warfare seemed within reach, such episodes demonstrated that a few well-placed machine-guns and light artillery

¹⁷¹ Nicholson, *Official History*, 448-56; Schreiber, *Shock Army*, 102-106.

could easily defeat light armored cars and cavalry. This Corps gained a valuable lesson regarding mobile warfare and the unsuitability of light armored cars and cavalry. The Corps quickly interpreted this lesson and limited the use of such forces in the future.¹⁷²

The rapid but orderly retreat of the German Army presented a different set of challenges for the Corps. As it advanced into more populated areas of France, the Corps placed severe restrictions on the use of artillery. Furthermore, the Corps had advanced some forty miles beyond its main logistical bases which made keeping it supplied difficult, particularly given the shattered roads clogged with newly liberated but hungry refugees that the logistics units relied upon to conduct resupply operations. As Currie recorded in his diary entry on October 20, “Our trouble is that the troops are very tired and that the getting forward of supplies is becoming very difficult owing the distance away of rail heads.”¹⁷³ The speed of the German retreat combined with the challenges of resupply made maintaining contact with the retreating Germans Currie’s biggest concern. The armored cars and cavalry could maintain contact with the Germans but any hard fighting required infantry and artillery. Each day the Corps advanced until it came up against a hastily prepared defensive position. Currie stressed to his subordinates not to waste lives on these positions as the Germans abandoned them each night. This meant that the Germans controlled the pace of the withdrawal, but Currie could do little about it given the length of his supply lines and the exhaustion of his troops. Still, despite these conditions the Corps averaged four kilometers per day between October 11 and 24, a rate of advance unheard of in the years of trench warfare.¹⁷⁴

For their part, the Germans intended to make a stand on the hastily constructed Herman Line anchored on the city of Valenciennes, just five miles from the Belgian-French border. Mount Houy, a piece of dominating terrain two miles south of Valenciennes, controlled the

¹⁷² Cook, *Shock Troops*, 546-50; Nicholson, *Official History*, 459-60.

¹⁷³ Currie, *Selected Papers*, 126.

¹⁷⁴ Schreiber, *Shock Army*, 116-18.

approaches to the city. Mount Houy resembled Vimy Ridge in its scope and ability to control the terrain surrounding it. It provided a good defensive position and the Germans intended to take full advantage of it. General Horne, commanding the British First Army, directed the British XXII Corps to take Mount Houy and the Canadian Corps to secure the approaches to Valenciennes. The British attack on October 28 failed but the supporting Canadian attack left the Corps in possession of the terrain on three sides of Mount Houy. Horne now directed Currie to take Mount Houy the next day. Rather than rush into a poorly coordinated attack against strong German defenses, Currie once again demanded time to prepare and spent the following three days preparing for the attack. Currie sensed the end of the war and he wished to avoid unnecessary casualties, preferring to expend ammunition rather than lives on Mount Houy. In planning for the assault Currie told Brigadier-General Andy McNaughton, his artillery chief, "The war must nearly be over now and I do not want any more fighting or casualties than can be helped...I told Andy McNaughton I thought this would be the last barrage I would ask him to make in the war."¹⁷⁵ On November 1, 1918, an immense artillery barrage fired from three sides of Mount Houy obliterated the German defenses. Currie sent in only one brigade and simply mopped up what remained, the Germans having surrendered *en masse*.¹⁷⁶

The loss of Mount Houy made the German positions around Valenciennes untenable. The Germans began to abandon the Herman Line and the Corps entered Valenciennes unopposed on November 2. The pattern of operations now resembled the days following Cambrai. Each day the Corps advanced until stopped by German delaying positions. By the next morning, the Germans abandoned their positions and the advance continued. On November 10, the leading elements of the Corps arrived at the outskirts of Mons, Belgium, the site of the British Army's first

¹⁷⁵ Currie, in Schreiber, *Shock Army*, 123.

¹⁷⁶ Nicholson, *Official History*, 471-75.

engagement with the Germans in August 1914. For the Canadians the end of the war seemed close and rumors of an armistice ran rampant throughout the Corps. Currie even held meetings on November 5 and 6 on the plan to demobilize the Corps.¹⁷⁷ In the early hours of November 11, elements of the Corps infiltrated into Mons and by daybreak engaged in sporadic fighting within the city. At 8:00 a.m., the 28th Battalion launched the final Canadian attack on the Western Front and seized its objectives in only three hours. Ten minutes prior to the signing of the armistice, Private George Price of the 28th Battalion became the final Canadian soldier to die on the Western Front.¹⁷⁸

Analysis

During the period between the conclusion of the Battle of the Somme in November 1916 and the Armistice in November 1918, the Canadian Corps matured as a fighting force and exhibited the characteristics of a learning organization. David Garvin described a learning organization as one that systematically creates or acquires information and then interprets, transfers, and retains that information in order to change its behavior.

Within this period, the Corps created or acquired information from numerous sources. Each of the Corps' engagements provided information captured in battalion, brigade, and division after-action reports and war diaries. Activities such as trench raids provided the opportunity to test new ideas or confirm existing ones. The Corps also acquired information from outside the organization. The British Army distributed after action reports, pamphlets, and summaries throughout the British Expeditionary Force. As Gary Sheffield wrote, by 1916 "British and Dominion formations should not be thought of as being hermetically sealed; there was a constant

¹⁷⁷ See Currie, *Selected Papers*, 133-36.

¹⁷⁸ Currie, *Selected Papers*, 139.

interchange, both formal and informal, of information and ideas build into effective doctrine for the BEF as a whole.”¹⁷⁹ The Canadian Corps did not limit itself to information distributed by the formal British chain of command. Currie’s visit to the French Army at Verdun in the critical period before Vimy served to confirm his own nascent ideas concerning the use of artillery and leadership on the battlefield. This visit played a key role in preparing the Corps for its victory at Vimy Ridge. Similarly, the dispatch of Canadian officers to the Australian training depot to study the latest doctrine regarding infantry and tank cooperation prior to the Battle of Amiens in 1918 further demonstrates the Canadian Corps’ efforts to acquire information from outside the Corps.

Byng’s implementation of a detailed lessons learned process reveals a systematic effort to interpret the various lessons learned from the Somme, a process that continued under Currie’s leadership. This analysis revealed the value of platoon tactics and resulted in the transfer of weapons systems, such as the Lewis Gun, back to the platoon giving it the firepower needed to assault German fortifications and to defend against the inevitable German counter-attacks. The Corps also correctly interpreted the importance of the rolling barrage and improved its effectiveness beyond Vimy Ridge and into the Hundred Days. That the Corps experienced errors in this period are evident. However, its ability to correct those errors rapidly further marks its development as a learning organization. For instance, during the Hundred Days as the Corps began to make rapid advances each day, it interpreted and then quickly changed its behavior, slowing the tempo of the advance to ensure artillery remained in range to support the lead troops.

This period also provides ample evidence of the transfer of knowledge within the Corps. Both Byng and Currie’s insistence on detailed training and rehearsals prior to major operations such as Vimy Ridge and Passchendaele ensured that each member of the Corps understood the

¹⁷⁹ Gary Sheffield, “How Even Was the Learning Curve? Reflections on the British and Dominion Armies on the Western Front, 1916-1918,” in *Canadian Military History Since the 17th Century: Proceedings of the Canadian Military History Conference, 5-9 May 2000*, ed. Yves Tremblay (Ottawa: National Defence, 2001), 130.

latest lessons and could apply them on the battlefield. Such training also confirmed that each soldier understood his role and the role of his platoon and company. The detailed planning and intelligence gathering displayed at Vimy paid immediate dividends and Currie routinely insisted on additional time to prepare and improve the Corps prior to an assault such as at Passchendaele. Again, the transfer of knowledge within the Corps directly improved its effectiveness.

By Vimy Ridge in April 1917, the Corps developed into a cohesive and efficient force. That the Corps maintained this level of efficiency throughout the 1917 to 1918 period despite its high casualties and corresponding influx of replacements indicated that it successfully retained the information necessary to change its behavior. This is all the more remarkable given the high tempo of operations during the final hundred days of the war.

Cross Case Analysis: The Canadian Corps as a Learning Organization

The history of the Canadian Corps in World War I reveals an organization that initially struggled to adapt to its environment. The Corps experience from Ypres to the Somme indicated an organization suffering from various learning deficiencies. It consistently failed to achieve its objectives on the Western Front while suffering high casualties. The inability of the Corps to adopt the tenets of a learning organization, one that creates or acquires information and then interprets, transfers, and retains that information, directly contributed to its failure to adapt to its environment in the pre-Vimy period. The Corps limited its creation or acquisition of information largely to its own experiences. It made little attempt to acquire information from outside organizations. The Corps did attempt to interpret the knowledge it managed to acquire from these limited sources, but it failed to transfer that knowledge throughout the organization. The 2nd Division's experience at St Eloi and the 3rd Division's experience at Mount Sorrel demonstrate the fact that information acquired by the 1st Division did not transfer to the other divisions in the Corps. Furthermore, the inability of the Canadian training establishment to train replacements in

the latest techniques further illustrates the inconsistent nature of the Corps attempts to disseminate information.

Beginning with the training period prior to Vimy Ridge, the Corps began to systematically employ the tenets of a learning organization. It acquired information from both inside and outside the Corps as demonstrated by Currie's visit to Verdun and by taking advantage of the Australian Corps experience with tanks prior to the Amiens in 1918. The lessons learned process established by Byng and perpetuated by Currie—a process notably absent under Alderson's leadership—facilitated the interpretation of information. The importance of rehearsals and universal training standards first implemented in the preparation for Vimy Ridge paid immediate dividends and illustrated the Corps' focus on transferring knowledge. The Corps further demonstrated its development as a learning organization through its efficient retention of knowledge during the Hundred Days, despite having to cope with heavy casualties.

Thus, the Corps only demonstrated some of the tenets of a learning organization in the period between Ypres and the Somme, and it did so on an inconsistent basis. However, the Corps' performance improved dramatically beginning with Vimy Ridge and continued throughout the rest of the war. This resulted directly from the Corps' consistent adoption of the tenets of a learning organization.

Conclusion and Implications

The experience of the Canadian Corps in World War I demonstrated the challenges faced by a military force faced with the challenge of adapting to a new and particularly complex environment. Military organizations that cannot accomplish their goals must either identify their errors and adapt or ultimately fail. Adapting requires that the organization adopts the tenets of a learning organization—one that systematically acquires or creates information, then interprets, transfers, and retains that knowledge in order to change its behavior. In the Canadian Corps'

experience, two factors directly contributed to its successful transformation into a learning organization.

The Corps possessed an organizational culture that accepted change, fostered critical thinking, and accepted recommendations for change from all levels, from both within the Corps and outside it. Military organizations should encourage an open environment and interpret recommendations objectively, no matter their origins, and once deemed appropriate they should transfer and retain those recommendations. The Canadian Corps also managed successful adaptation in a challenging environment because of its homogeneity. The uniformity in the Corps organization directly contributed to its ability to adapt quickly and efficiently. The same four divisions with their corresponding enablers resulted in common procedures and trust within the Corps. This facilitated the rapid diffusion and implementation of new methods. Militaries seeking to act as learning organizations should consider retaining unit cohesion and habitual relationship structures as much as possible. Ensuring that the same units work together on a consistent basis establishes trust and facilitates rapid adaptation.

Bibliography

- Argyris, Chris, and Donald A. Schön. *Organizational Learning: A Theory of Action Perspective*. Reading, MA: Addison-Wesley Publishing Company, 1978.
- Army Doctrine Publication 1-02, *Operational Terms and Military Symbols*. Washington, DC: Government Printing Office, 2012.
- Berton, Pierre. *Vimy*. Toronto: Anchor Canada, 1986.
- Boff, Jonathan. "Combined Arms during the Hundred Days Campaign: August – November 1918." *War in History* 17, no.4 (November 2010): 459-78.
- Brennan, P and T. Leppard, "How the Lessons Were Learned: Senior Commanders and the Moulding of the Canadian Corps after the Somme." In *Canadian Military History Since the 17th Century: Proceedings of the Canadian Military History Conference, 5-9 May 2000*, edited by Yves Tremblay, 135-44. Ottawa: National Defence, 2001.
- Brennan, Patrick. "Julian Byng and Leadership in the Canadian Corps." In *Vimy Ridge: A Canadian Reassessment*, edited by Geoffrey Hayes, Andrew Iarocci, and Mike Bechtold, 87-104. Waterloo, ON: Wilfred Laurier University Press, 2007.
- Brown, Ian M. "Not Glamorous, But Effective: The Canadian Corps and the Set-Piece Attack, 1917-1918." *Journal of Military History* 58, no. 3 (July 1994): 421-44.
- Cook, Tim. *At the Sharp End. Canadians Fighting the Great War 1914-1916*. Toronto: Penguin, 2007.
- . "Battles of the Imagined Past: Canada's Great War and Memory." *The Canadian Historical Review* 95, no. 3 (September 2014): 417-26.
- . *Shock Troops: Canadians Fighting the Great War, 1917-1918*. Toronto: Penguin, 2008.
- Currie, Arthur. *The Selected Papers of Sir Arthur Currie: Diaries, Letters, and Report to the Ministry, 1917-1933*. Edited by Mark Osborne Humphries. Waterloo, ON: Wilfred Laurier Press, 2008.
- Dickson, Paul. "The End of the Beginning: The Canadian Corps in 1917." In *Vimy Ridge: A Canadian Assessment*, edited by Geoffrey Hayes, Andrew Iarocci, and Mike Bechtold, 31-49. Waterloo, ON: Wilfred Laurier University Press, 2007.
- Downie, Richard D. *Learning from Conflict: The U.S. Military in Vietnam, El Salvador, and the Drug War*. Westport, CT: Praeger, 1998.
- Duguid, A.F. *Official History of the Canadian Forces in the Great War, 1914-1919*. Ottawa: King's Printer, 1938.
- Garvin, David A. *Learning in Action: A Guide to Putting the Learning Organization to Work*. Boston: Harvard Business School Press, 2000.
- Godefroy, Andrew B. "The Advent of the Set-Piece Attack: Major-General Arthur Currie and the Battle of Mount Sorrel, 2-13 June 1916." In *Great War Commands: Historical Perspectives on Canadian Army Leadership, 1914-1918*, edited by Andrew B. Godefroy,

- 1-19. Kingston, ON: Canadian Defence Academy Press, 2010.
- Granaststein, J.L. *Canada's Army. Waging War and Keeping the Peace*. Toronto: University of Toronto Press, 2002.
- Great Britain War Office General Staff. *Summary of Recent Information Regarding the German Army and its Methods*. London: Harrison and Sons, 1917.
- Griffith, Paddy. *Battle Tactics of the Western Front: The British Army's Art of Attack 1916-1918*. New Haven: Yale University Press, 1994.
- Gudmundsson, Bruce I. *Stormtroop Tactics: Innovation in the German Army, 1914-1918*. New York: Praeger, 1989.
- Hart, Peter. *The Great War: A Combat History of the First World War*. New York: Oxford University Press, 2013. iBooks.
- Hatch, Mary Jo, and Ann L. Cunliffe. *Organization Theory. Modern, Symbolic, and Postmodern Perspectives*. 2nd ed. New York: Oxford University Press, 2006.
- Hogg, Michael A. "Social Identity Processes and the Empowerment of Followers." In *The Art of Followership: How Great Followers Create Great Leaders and Organizations*, edited by Ronald E. Riggio, 267-76. Hoboken, NJ: Jossey-Bass, 2008
- . "Social Psychology of Leadership." In *Social Psychology: Handbook of Basic Principles*, edited by Arie W. Tory and Edward Kruglanski, 716-33. New York: Guilford Press, 2007.
- Humphries, Mark Osborne. "Old Wine in New Bottles: A Comparison of British and Canadian Preparations for the Battle of Arras." In *Vimy Ridge: A Canadian Reassessment*, edited by Geoffrey Hayes, Andrew Iarocci, and Mike Bechthold, 65-86. Waterloo, ON: Wilfred Laurier University Press, 2007.
- Iarocci, Andrew. *Shoestring Soldiers: The 1st Canadian Division at War, 1914-1915*. Toronto: University of Toronto Press, 2008.
- Keegan, John. *The First World War*. New York: A.A. Knopf, 2001.
- Kennedy, Paul. "Britain in the First World War." In *Military Effectiveness Vol.I, The First World War*, edited by Allan R Millett and Williamson Murray, 31-79. Winchester MA: Unwin Hyman, 1988.
- Kolb, David. *Experiential Learning: Experience as the Source of Learning and Development*. Englewood Cliffs, NJ: Prentice Hall, 1984.
- Korte, Russell F. "A Review of Social Identity Theory with Implications for Training and Development." *Journal of European Industrial Training* 31, no. 3 (June 2007): 166-80.
- Lupfer, Timothy. *The Dynamics of Doctrine: The Changes in German Tactical During the First World War*. Leavenworth Papers, no. 4. Fort Leavenworth, KS: Combat Studies Institute, 1981.
- Morton, Desmond. *A Military History of Canada: From Champlain to Kosovo*. Toronto:

- McClelland and Stewart, 1999.
- Murray, Williamson. Introduction to *Military Adaptation in War: With Fear of Change*, 1-36. New York: Cambridge University Press, 2011.
- Nagl, John A. *Learning to Eat Soup with a Knife: Counterinsurgency Lessons from Malaya and Vietnam*. Chicago: University of Chicago Press, 2005.
- Nicholson, G. W. L. *Official History of the Canadian Army in the First World War: Canadian Expeditionary Force 1914-1919*. Ottawa: Queen's Printer, 1962.
- North Atlantic Treaty Organization. *Allied Joint Doctrine*. 2010.
- Passingham, Ian. *All the Kaiser's Men: The Life and Death of the German Army on the Western Front, 1914-1918*. Stroud: Sutton, 2003, 139-44.
- Philpott, William. *Three Armies on the Somme*. New York: Alfred A. Knopf, 2010.
- Pugsley, Christopher. "Learning from the Canadian Corps on the Western Front." *Canadian Military History* 15, no. 1 (Winter 2006): 5-32.
- Rawling, Bill. *Surviving Trench Warfare: Technology and the Canadian Corps, 1914-1918*. Toronto: University of Toronto Press, 1992.
- Robbins, Stephen P, and Nancy Langton. *Organizational Behaviour: Concepts, Controversies, Applications*. Toronto: Pearson Education, 2003.
- Schein, Edgar H. *Organizational Culture and Leadership*. 4th ed. San Francisco: Jossey-Bass, 2010.
- Schreiber, Shane B. *Shock Army of the British Empire: The Canadian Corps in the Last 100 Days of the Great War*. Westport, CT: Greenwood Publishing Group, 1997.
- Senge, Peter M. *The Fifth Discipline: The Art and Practice of the Learning Organization*. New York: Doubleday, 2006.
- Sheffield, G. D. "How Even Was the Learning Curve? Reflections on the British and Dominion Armies on the Western Front, 1916-1918." In *Canadian Military History Since the 17th Century: Proceedings of the Canadian Military History Conference, 5-9 May 2000*, edited by Yves Tremblay, 125-34. Ottawa: National Defence, 2001.
- Sheldon, Jack. *The German Army on the Somme 1914-1916*. Barnsley: Pen and Sword Books, 2007.
- . *The German Army on Vimy Ridge 1914-1917*. Barnsley: Pen and Sword Books, 2008.
- Travers, Tim. *How The War Was Won: Command and Technology in the British Army on the Western Front, 1917-1918*. New York: Routledge, 1992.
- . *The Killing Ground: The British Army, the Western Front and the Emergence of Modern Warfare 1900-1918*. Winchester, MA: Allen and Unwin, 1987.
- Winter, Denis. *Haig's Command: A Reassessment*. New York: Penguin, 1991.

Zeuhlke, Mark. *Brave Battalion: The Remarkable Saga of the 16th Battalion (Canadian Scottish) in the First World War*. Mississauga, ON: J. Wiley and Sons Canada, 2008.