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The Other Side of the Hill: Combat Intelligence in the Canadian Corps, 1914–1918

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For some, a discussion on military intelligence and the First World War is the ultimate oxymoron. They might ask: when and where did generals display any use of intelligence? That the Battle of the Somme continued beyond the first day, they might argue, demonstrates a complete lack of military intelligence, or any other type of intelligence for that matter. If there ever was a war, they might add, where donkey-like officers led lion-like soldiers to slaughter against barbed wire, machine guns, and trenches, then the Great War was it.[1] The oft told story of how Sir Launcelot Kiggell, Sir Douglas Haig's chief of staff, upon seeing the Passchendaele battlefield and its sea of mud and carnage, reportedly wept, "My God! Did we send men to fight in that?" only to be answered by an aid: "It's worse further up," has lent credence to the position that the British high command was, indeed, incompetent. The myth that British generals were donkeys is an old one, and not likely to disappear completely anytime soon – at least in popular imagination. However, a study of combat intelligence should help to dispel this myth, for when intelligence was used wisely – as it usually was in the Canadian Corps – it increased the likelihood of success in the field. It did this by dispersing some of the fog of war and the resulting battlefield confusion. Good intelligence gave planners the details necessary for preparing the incredibly complex set-piece battles that were the hallmark of First World War combat. Such meticulous care and precision preparation ensured that there were fewer surprises on Zero Day, the day of attack, then otherwise would have been the case. By cutting through the fog of war, intelligence reduced the assaulting troops' dependence on circumstance and luck, while restoring to commanders some degree of control over events in what was an otherwise highly chaotic environment. This was no small matter, especially on battlefields where communications were painfully slow, erratic and unreliable. Officers and men of the Great War faced conditions and technological advances that had completely altered warfare from what they had expected and trained for. To compensate, the Canadians, and others, used combat intelligence to help overcome such obstacles as poor communications, heavy machine-gun and artillery fire, entrenchments and barbered wire, and came to see it as a crucial element in waging successful trench warfare.

Of course, there was more to winning trench warfare than good intelligence, and this should be made clear from the beginning. Intelligence was only one of many factors leading to successful operations. The importance of terrain, weather, personality, tactics, bravery, and other local and strategic considerations all played their part, and their importance cannot be dismissed or diminished. Nevertheless, intelligence work was vital for planning purposes and should be recognised, for intelligence was everywhere and permeated all aspects of First World War combat.

Despite its obvious importance to battlefield success, combat intelligence remains a relatively unexplored topic in Great War historiography. J.E. Hahn's 1930 publication *The Intelligence Service Within the Canadian Corps, 1914-18*, is the principal exception. It deals directly with the nuts and bolts of tactical intelligence gathering, and reflects Hahn's experience as an intelligence officer in the 4th Canadian Division. *The Intelligence Service* is an excellent place to

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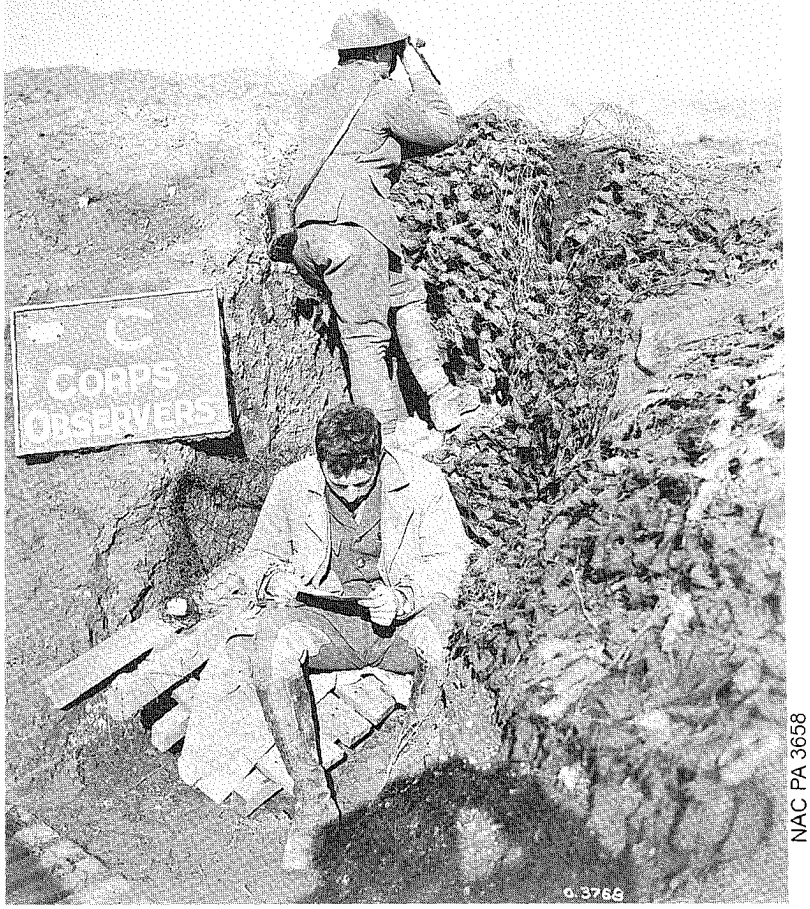

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A Canadian Artillery observation post in the reserve line, January 1918.

start research on combat intelligence, as Hahn explains in an uncritical manner some of the Corps' routine intelligence functions, organisation and equipment requirements. Unfortunately, he does not analyse intelligence work in conjunction with other operational arms. He omits for the most part any discussion of artillery intelligence even though from late 1916, combat intelligence focused largely on the needs of the gunners. Moreover, he sticks mainly to the intelligence requirements of divisional and lower commands.[2] On the other hand, neither the British nor Canadian official histories develop intelligence as a theme.[3] This is true for other works as well, and largely because most authors are simply not concerned with the details of intelligence gathering in the field. Consequently, we are often left guessing as to its hidden importance to operations. It is not uncommon to read, for example, that the Canadian Corps was facing certain German regiments, that these regiments were at half strength, tired, suffering from low morale, or awaiting reinforcement. What we are not always told, though, is if these details were known at the time, or if this is historical hindsight at work. If they were known at the time, we are usually not told how the Canadians came to know such information. The Germans, after all, were not stupid, nor did they volunteer information on their strengths and weaknesses. In the face of a hostile enemy, the Canadians had to gather, interpret, sort, and incorporate such information into their plans for themselves. The fog of war was real, and the Canadian Corps had to find ways to navigate through it – for failing to do so meant almost certain death for countless young men.

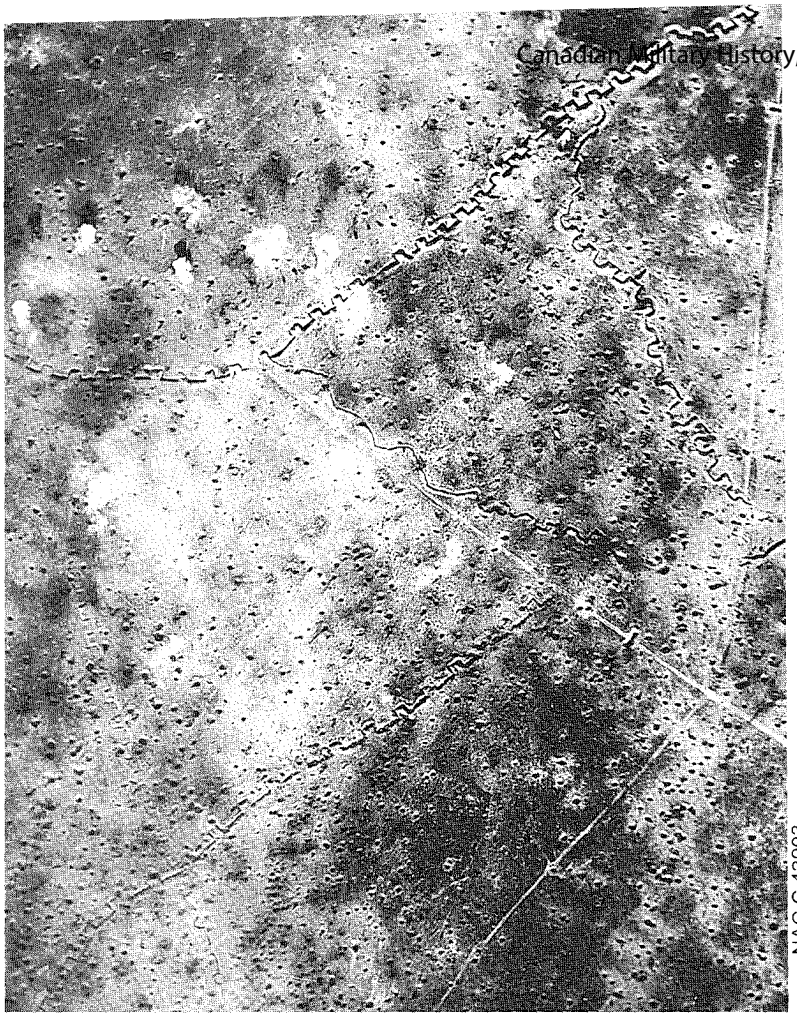
Men who fought in the Great War knew the importance of intelligence for wining trench warfare, and several of them wrote of their experiences. Works by Andrew McNaughton, Canada's premier artillery officer during the war, and British veterans like John Innes, who wrote about flash spotting and sound ranging, H. Hesketh-Prichard and his account on sniping, and articles by A.F. Brooks and H. Winterbotham, who wrote on artillery intelligence and survey work respectively, provide important insight into the workings of intelligence in the field.[4] Unfortunately, their efforts to show the difficulties confronting officers and men fighting a modern industrial war, and the role intelligence played in such a war, fell on the public's deaf ears, and were no match for publications perpetuating the generals-as-donkeys myth. Eventually those who knew firsthand the importance of intelligence stopped writing about it, and took their experiences to their graves. The study of intelligence petered out – that is until recently.[5] Today's scholarship surrounding tactics, doctrine, unit organisation, firepower, military professionalism, generalship, and logistics have successfully challenged the Generals-as-donkeys myth.[6] Thanks to these kinds of studies we can more clearly see the difficulties faced by officers and men of the Great War, and the enormity of their challenge in the new combat environment. Without our old blinders on it is easier to acknowledge the talent and proficiency with which British and Canadian officers performed their duties. There is no better proof of this than the final 100 Days campaign that ended the war with Germany's defeat. Donkeys could not have led such a successful crusade.

Since the topic of intelligence is so vast, and since intelligence permeated every decision made

and every action taken in the Great War, it can only be touched upon briefly in this article. This overview of intelligence in the Canadian Corps will, however, show just how important combat intelligence was to the Canadian Corps' battlefield success. By war's end the Canadian intelligence organisation had evolved from an understaffed, under-trained, and under-utilised force into a highly competent and professional body capable of gathering intricate and divergent material on the enemy's positions and capabilities. Any review of Corps operational orders bears witness to the importance of the intelligence service. The intelligence organisation attempted to track down every possible German machine gun location, strong point, observation post, and gun emplacement amongst a variety of other targets. It monitored both wire destruction and construction, followed enemy troop movements, identified the locations of German reserve units and calculated how long it would take these units to reach given sectors of the front, and by what likely routes. It was not uncommon for contemporary commanders to praise the intelligence they received in their after-action reports, while pointing out how the information helped them win battles. The detail contained in operational orders, the desire and need to know everything about the German position and the intervening terrain, the increased complexity and specialisation of the intelligence organisation, and the search for new and improved techniques for collecting that detail, all attest to the value Canadian planners placed on the Corps' intelligence organisation.

The unbroken trench system on the Western Front defined the war and determined the role intelligence played. The close proximity of the opposing lines offered a unique opportunity for a tactical intelligence service. Since the enemy lived within rifle shot, commanders had to be vigilant and prepared to meet enemy forays at any time. The closeness of the enemy also diminished reaction time, which meant that commanders had to discover every indication of a forthcoming attack, however slight, to avoid surprise and possible catastrophe. There was no respite from active campaigning as in past wars, when fighting was limited to fair weather months. The enemy was always present, and he had to be studied to understand his habits; it was vital for survival to recognise when he was in an aggressive or defensive mode. To this end, it came to pass that every headquarters, from battalion upwards, compiled detailed reports on observations made of German activity seen and sounds heard. Such a close analysis of the enemy produced a mountain of information for headquarters personnel to digest. Most of this material may at first appear inconsequential, as Intelligence Summaries and patrol and observation reports are replete with references to seemingly meaningless detail: German parapet altered; Germans talking in a particular trench or shell hole; a green flare over a certain sector; one enemy aircraft flying east to west at 10:30 am over such-and-such a position. However, to trained and experienced intelligence personnel, this data helped build a repository of facts on various sectors and the German activity therein. From such profiles, intelligence officers and staff planners pieced together possible scenarios outlining German intentions, resilience and resolve. The altered parapet might mean that the Germans had readied gas cylinders for use, or that the Germans were constructing dugouts or machine gun posts. The men talking might mean relaxed security on this part of the German line, and therefore an ideal spot for a Canadian raid. Intelligence officers would link the green flare to the activity that preceded or followed its firing to determine the meaning of some of the German signals. They would also track the aircraft's flight path to determine what the observer was witnessing, and to check how far behind friendly lines the plane travelled. Knowing what the observer may have seen could alter friendly planning. Flight path patterns might point to a possible German raid or attack on the sector in question. Determining how far behind friendly lines the plane travelled might show headquarters the depth of penetration the Germans expected to obtain, and the ultimate objective of the assault. Of course one aircraft, or one pile of lumber, or one flare was not conclusive evidence for formulating opinions of German intentions, but when amalgamated with the mass of other evidence collected, certain conclusions regarding enemy activity, habits and possible intentions, became clearer.

The closeness of the opposing lines did not mean that intelligence gathering was easy. It was not simply a matter of looking over a trench wall and writing down all that was seen. Time and again soldiers' diaries refer to the emptiness of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An aerial photograph of a Canadian attack in progress on the east end of the Hessian Trench, near Courcellette, on 26 September 1916. Explosions are clearly visible in the top left corner (white puffs with dark shadows underneath).

the battlefield. Rarely did one see a live German. For one thing, anyone popping their head up over the parapet for more than a couple of seconds, and in the same spot more than once, was liable to lose it to an enemy sniper. One of the first warnings every man received when entering the trenches for the first time was "Fear God and keep your head down." Snipers made death come quickly. Alexander McClinton, a sergeant with the 87th Battalion, recalled one instance where one of his mates stood "on the firing step, pushed back his trench helmet and remarked that he thought it was about time for coffee. He didn't get any. A German sharpshooter, firing for the first time that day, got him under the rim of his helmet, and his career with the Canadian forces was over right there."[7] If snipers were not active at the time it was still unlikely that peeking over a trench wall would gain much advantage. One could not see everything that needed to be seen from friendly lines at ground level, even with the aid of a telescope or field glasses. An enormous effort was involved in gathering intelligence, and it became more complex as the war progressed. Techniques for unmasking enemy positions increased in complexity hand-in-hand with the enemy's efforts to conceal them.

Histories of the war regularly point out that the trench lines barely altered over the four years of slaughter. In a strategic sense this may be true. At the tactical, trench level, stagnation did not occur. Constant shelling and digging, for example, continuously transformed the landscape. Canadian soldiers who fought in the Ypres Sector during the Second Battle of Ypres in April 1915, hardly recognised the place when they returned to it a year later. By November 1917, during the Third Battle of Ypres, the terrain had become wholly unrecognisable. Where woods and farms once stood there remained but a few burnt stumps and the occasional brick or stone. Physical features were obliterated under the weight of millions of artillery rounds, and their locations were known only because they were once marked on maps. Terrain features changed from one day to the next, and soldiers, even with maps in hand, often had no idea where they were. Sergeant McClintock remembered the devastation along the Somme front in 1916 where he "went through the town of Pozieres twice and didn't know it. It had a population of 12,000 before the war. On the spot where it had stood not even a whole brick was left, it seemed. Its demolition was complete."[8]

Defensive works, too, continually changed. Every day the Germans added new wire entanglements, strengthened and thickened those already in place, built dugouts, and shifted and camouflaged artillery emplacements, observation posts and unit headquarters. Trenches were always under construction, saps dug, assault preparations made, reliefs in the line carried out, and new tactics experimented with. The British Army's General Headquarters' (GHQ) call to identify the constantly shuffled German units was itself a tremendous task that devoured enormous time and effort. To keep abreast of the incessant and rapid alterations to the ground and the enemy's position, commanders and men required a well organised and efficient intelligence service.

Since the tactical arena changed so quickly, and so often, the need for planning information

continued up to the last possible moment prior to Zero Hour. Prior to raids and major offensives, the collected intelligence meant that maps, photographs, and training grounds could be constantly up-dated to reflect the latest news. One man remembered that when training for one particular raid "Our practice section [of trench] was changed a little several times, because aerial photographs showed that the Germans had been renovating and making some additions to the trenches in which we were to have our frolic with them."[9] After the Battle of Passchendaele, Brigadier General W.A. Griesbach, commanding the 1st Brigade, noted how small details affected planing right up to the moment of attack. In his after-action report he recorded that when the brigade "learned that the enemy brought his barrage down either on or immediately in rear of our line, it was agreed that our forming up for the attack should be as close to the enemy as possible." Further,

> When it was learned that whole companies had been shot down and lay dead practically in the line on which they stood while advancing under the barrage, it was agreed that this Brigade would advance to the attack in section columns behind the barrage dashing from cover to cover, which was done and was successful. When it was learned that the enemy took cover in his pill boxes but fought from trenches in the neighbourhood of the pill box, it was agreed that the attack must be made at high speed and with great determination to catch the enemy before he emerged from his pill box or as soon thereafter as possible and this was carried out and it was successful.[10]

With proper intelligence, the "poor bloody infantry" had a better chance at surviving the crossing of no-man's-land. Battlefield intelligence did not guarantee success, but without it there was almost a certainty of failure.

The advent of aerial observation and the closeness of the opposing lines increased the demand for camouflage and deception during the war, which required further adaptation in the trenches. The British Army, for example, occasionally placed dummy soldiers in the trenches and manipulated them by ropes. It also used imitation sandbags, periscopes and sniper posts, and even built entire sections of simulated trench. The artillery used camouflaged netting and hid their guns under trees and in towns. Artificial gun flashes helped deceive enemy flash-spotters. Fake gun emplacements, craters and tracks also helped trick aerial observers and deceive photographic clerks examining the black and white images of the trenches. Dummy tanks were used at Lens, in August 1917; and prior to the Battle of Amiens in August 1918, the Canadians used bogus wireless traffic in an effort to deceive the Germans about their location. To aid in the art of deception the British created a camouflage organisation in March 1916, and even concealed its intent by giving it the innocuous sounding name "Special Works Park R.E." It was a GHQ unit under the direct control of the Engineer-in-Chief, and by August 1918 employed nearly 300 men. In 1918, the Canadian Corps added its own camouflage officer to its organisation to aid the Corps' deception efforts. The Germans, likewise, increased their concealment practices. Intelligence personnel were kept busy sifting through the false information to discover the truth about the opposing lines.

The strength of the German defences themselves called for intimate and ongoing study. If assaults against a German position were to have any chance of success, the strengths and weaknesses of those defences had to be

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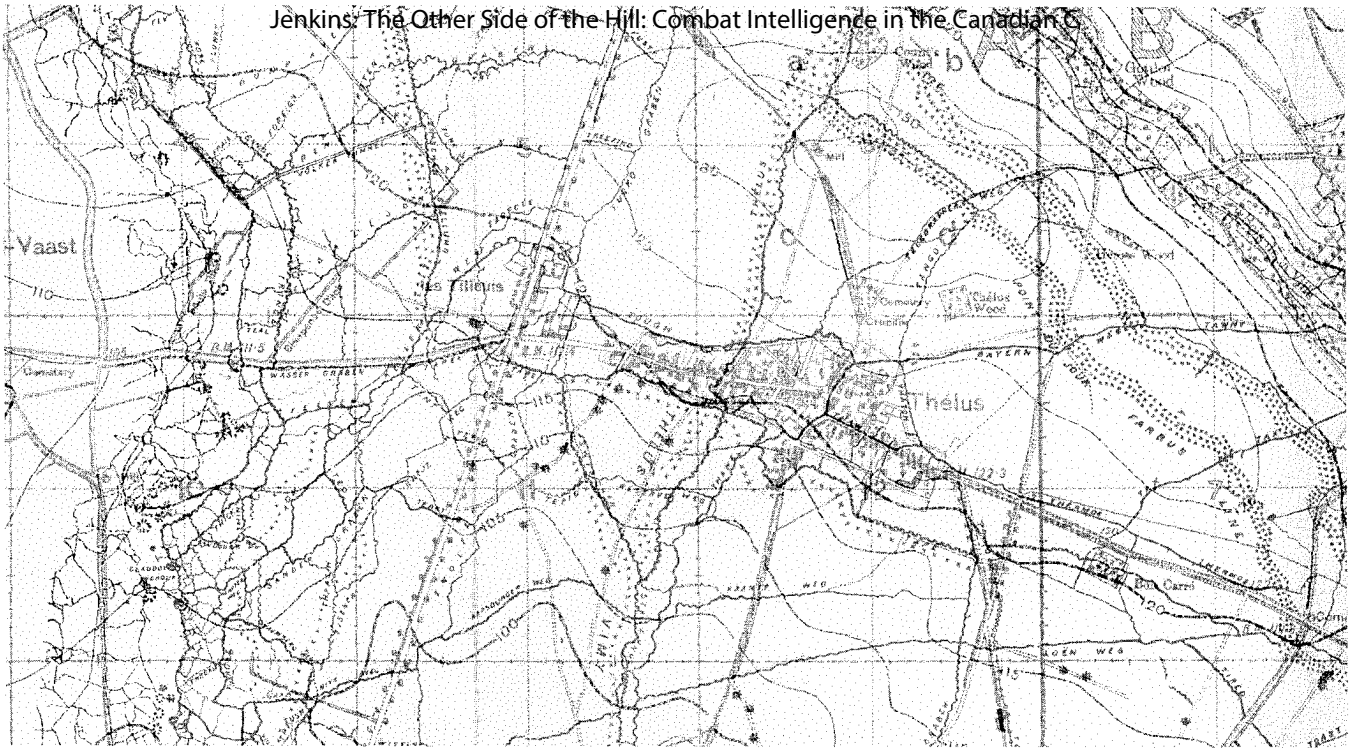
A team of horses pulls a dummy tank into position, December 1917.

discovered beforehand. The Canadians soon realised that intelligence officers, by steadfastly monitoring the German position, could create profiles of given sectors outlining their suspected weak spots. They could also note patterns in German defensive methods. Knowing, among other things, where unit and formation boundaries ended, the usual time and frequency of troop relief, and the typical layout of a machine gun defence, aided Canadian planning, helped win objectives, and reduced casualties in those commands that took the time to learn such details. Understanding friendly and enemy tactics was, therefore, another facet of successful intelligence work. Intelligence officers had to work hand-in-hand with the operations branch, and be current with improvements in the tactical deployment of both friendly and enemy troops. Knowledge of the overall plan was obligatory if the required information was to be gathered as part of an ongoing process. Intelligence personnel had to understand enemy tactics in order to know what to look for, when to look for it, and where to concentrate their efforts.

Meanwhile, the Canadian Corps' position in the larger British Army sometimes affected the utility of combat intelligence gathered by the front line troops and intelligence units. With the Canadian command subordinate to British authority, it was the British who made strategic and most operational planning decisions. The Canadians, regardless of what their intelligence organisation told them, did not always have the freedom of action to alter British-made plans. This was particularly the case early in the war, and before the Canadians earned their elite status. If the British ordered the Canadians to prepare an assault, that is what they did, even if intelligence reports suggested that such an assault was tantamount to suicide. The Canadians might object, and often did, but if a reprieve was not granted, they prepared their assault.[11] This is not meant as a criticism of army command structures, but it is important to remember that lower level formations were not always given much room to exercise independence of thought, be they Canadian or any other British formation.

On the other hand, being a subordinate formation within the larger British Expeditionary Force meant the Canadians were privy to a wealth of British battlefield experience and organisational expertise. General Headquarters had numerous sources of intelligence available to it: armies in the field, allies, the army's secret service, and the foreign office's own secret service. Armies had their own organisations and intelligence, too, which they cheerfully shared with their Imperial brethren. Each level of command sought and generated different kinds of intelligence. GHQ was largely concerned with strategic and operational level intelligence, with its greatest interest being the German order of battle. That is to say, GHQ wanted to know the composition of the German Army, how the constituent parts were grouped to fight under the various commands, and the combat reputations of those parts.[12] It wanted to know which divisions made up what German corps, along with the fighting reputations of the various commanders and formations. Knowing the composition of the German Army, (i.e. the number of corps, divisions, brigades and regiments) let GHQ track individual German formations and units across the front. By plotting troop movements and positions GHQ estimated probable locations for German offensive and defensive operations. The German order of battle, in other words, gave planners insight into the mind of the enemy high command. Identifying enemy units and formations was thus a major concern of GHQ, and this concern filtered down to battalions at the front whose role it was to collect the information necessary (from prisoners, documents, and other identifying material) for higher command to confirm the actual identifications.

GHQ had an interest in tactical intelligence as well. It regularly issued translations of captured German documents outlining enemy tactical doctrine, and published its own tactical pamphlets for BEF consumption. These were invaluable tools for lower level commands when planning offensive and defensive operations. GHQ intelligence also prepared evaluations on German attack methods, defensive techniques and signals. In a 23 February 1915 memorandum, for instance, GHQ discussed the German propensity for swift counter attacks on any Allied gains, and counselled taking this fact into consideration when planning offensives.[13] Captured German documents describing lessons learned from recent fighting were also invaluable as guides for what to expect in the future. Again, friendly troops could prepare accordingly.



This Allied trench map shows a sector of the Vimy front around the town of Thélus in 1917. The map shows the trench systems, both Allied and German, in considerable detail (based on aerial photographs) and includes the German names for the trenches (gained from captured enemy documents and prisoners of war).

Helpful, too, were captured German appreciations of Allied battle techniques. After all, it was always good to know what the enemy expected in order to do the opposite.

At army and corps headquarters the intelligence requirements shifted. By war's end, the British fielded five armies, all with intelligence interests similar to those of GHQ, but on a narrower scale. At the same time, armies needed to learn more about the tactical situation along their fronts than was of interest to GHQ. Corps, on the other hand, were principally concerned with tactical intelligence, but had some interest in the larger strategic and operational interpretations made by army command and GHQ. To help co-ordinate and control intelligence, the Canadian and other corps prepared and printed for distribution a daily Intelligence Summary of the previous day's more salient discoveries and activities. These provided a standardised, detailed recounting of all new information on the enemy's defensive position, including the location of gun emplacements, the depth of wire entanglements, and the location of dugouts, billeting areas and lines of approach. As well, corps and army commands were keenly interested in knowing the location of ammunition dumps, rail lines and so on, so that in the event of a breakthrough, they would better understand what lay in the green fields beyond. Corps also wanted to know the number of German divisions in a given sector. T his was a good indicator of the number of German batteries located there, as each German division held a specific number of guns. In turn, the disposition of the artillery was usually a clear measure of the enemy's aggressiveness. The number, calibre and range of German guns, along with knowledge of the exact direction they faced, told commanders a great deal about possible German actions and responses.

Enemy tactical dispositions were the main concern of divisions, brigades and battalions. Where *exactly* are the German machine guns placed? Where *exactly* are their listening stations, observation posts and command centres? Where *exactly* are their communication centres? Planners wanted answers to these and a host of similar questions before assault plans were finalised, for it was only in answering these questions that headquarters could successfully calculate and implement its plans. Moreover, unit and formation commands made every effort to learn for themselves the identity of the German units opposite, as front line commanders, like their GHQ counterparts, wanted to know the reputations of those they faced. To varying degrees, divisions, brigades and battalions were also interested in what lay behind the enemy's front line trenches. The battalions' main concern, however, was in

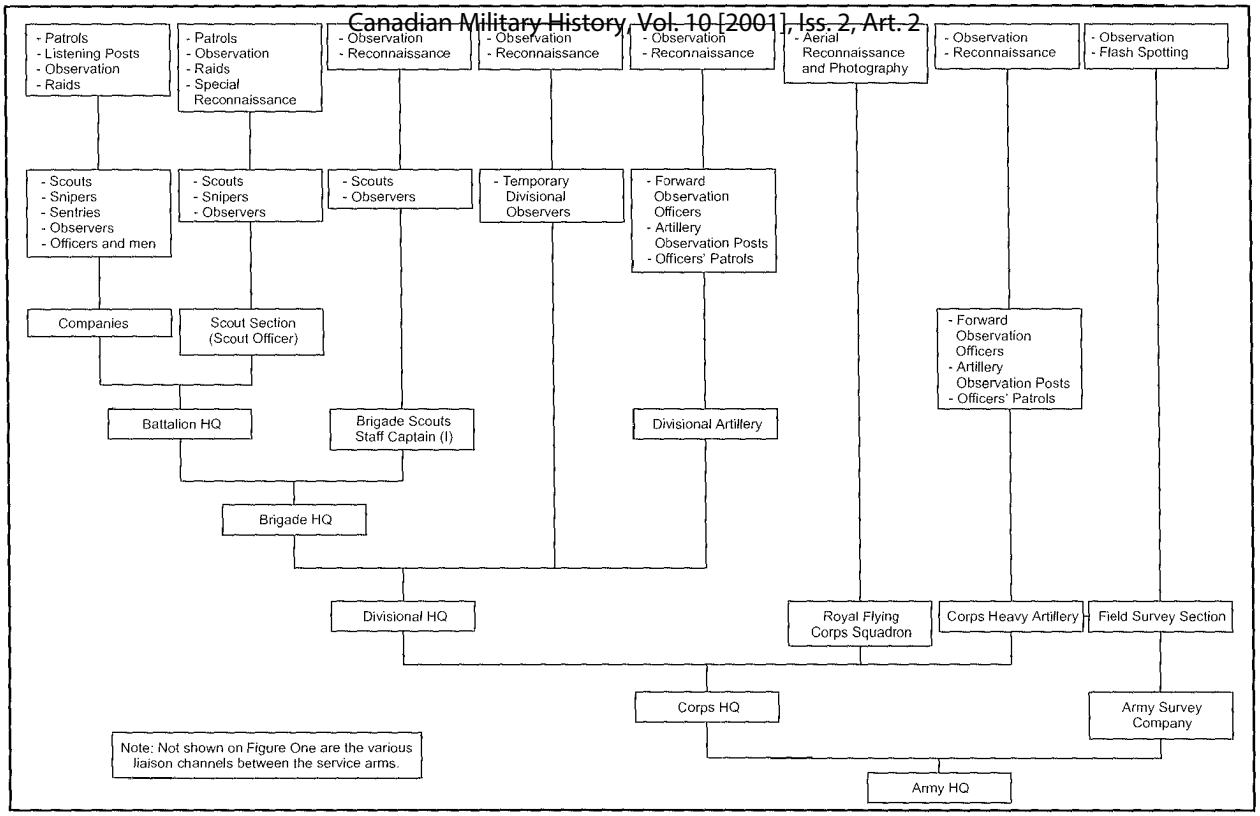


Figure One – Intelligence Sources in the Canadian Corps, August 1916

learning about no-man's-land and the German front line trench system. To do this all battalions, by May 1916, had formed specialist scouting units, under a scout officer, that were responsible for battalion-level intelligence gathering. By 1918 the scout section, also known as the battalion scouts, proved so valuable that the Canadians added a second officer to its strength. This meant the typical scout section employed about 28 men: eight snipers, eight observers, eight scouts, one scout corporal, one photographic clerk and draughtsman, and two officers. Brigades had interests similar to battalions, but were also interested in areas further to the rear. Like battalions, brigades formed their own intelligence sections to gather this information. Divisions, too, were interested in the front lines, but were even more concerned with the German rear areas. Divisional intelligence teams were led by one of the two General Staff Officers, second grade, (GSO2s), serving in Canadian divisions. In effect, the closer a given command was to the front lines, the more detail that command sought on the German lines immediately across from them. The further back a command lay, the more interest it had in areas further behind the German front.

Figure One, "Intelligence Sources in the Canadian Corps, August 1916" shows some of the organisational complexity of the intelligence system as practised by Canadians midway through 1916.[14] As intricate as it was, this organisation got even more complicated with each passing year. In 1917, for example, a Counter Battery Office (CBO) was formed to control artillery intelligence. Eventually this office became the hub around which all Corps intelligence swirled. By 1917, the artillery was clearly the dominant weapon system on the Western Front, and its intelligence needs were pervasive and paramount. As such, the CBO eventually reached the point where it received and interpreted most tactical intelligence generated in the Corps, especially if it affected gunner efficiency and action. With its being linked to every source of intelligence in and supporting the corps, the CBO was always up-to-the-minute on the latest German movements. In addition, the CBO, through a quirk in the Corps' command structure, was also the Heavy Artillery's tactical headquarters, and by being well connected to these and every other battery within and along the Corps' front, the CBO could quickly return a devastating barrage on targets wherever one was needed most. Through its control and use of tactical intelligence the CBO became one of the most powerful tools in the British and Canadian war effort.[15]

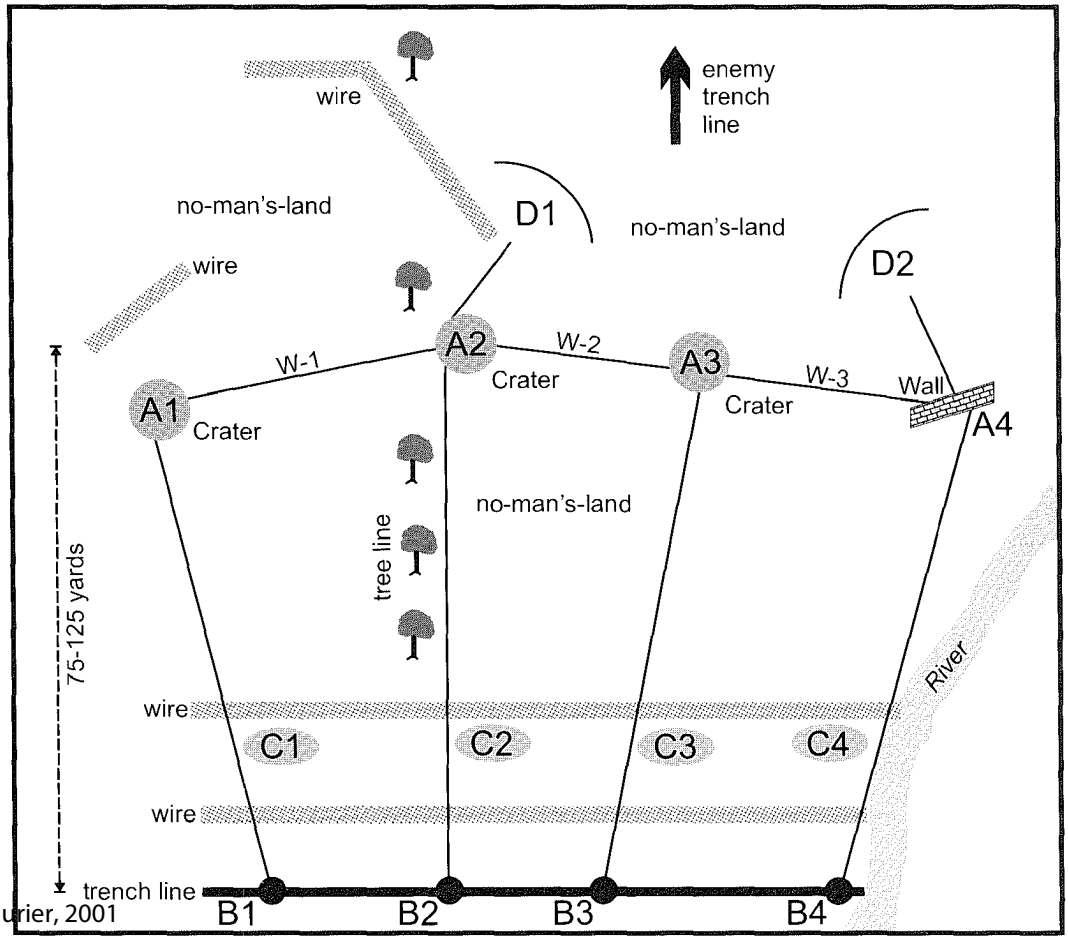
In 1918, the Canadian Corps added the Canadian Corps Survey Section (CCSS) to its

structure. The CCSS was a mobile, tactical intelligence gathering body formed in anticipation of the more open fighting expected that year, and in response to lessons learned in 1917 and during the Germans' March 1918 Spring Offensive. It employed 177 all ranks, was commanded by Captain W.R. Flewin, and was under the CBO's tactical control. Part of the CCSS team consisted of ground observers who followed front line action closely, and reported the latest friendly and enemy positions to its headquarters, which, as it so happened, was usually situated alongside the CBO. At the same time, the CCSS flash spotters maintained a constant vigilance for enemy artillery action and movement.[16] Combined with other sources of information, such as the Royal Air Force, the CCSS helped maintain a flow of reliable information during the more fluid battles of the 100 Days Campaign.[17]

Figure Two, "Battalion-level Intelligence Gathering, March 1916," illustrates something of the interconnectedness of front line intelligence gathering, and its importance in offering protection against surprise.[18] As shown in Figure Two, patrols (marked as D1 and D2) occupied the forward-most positions. These parties patrolled no-man's-land each evening on fact-finding missions, and acted as security screens for friendly trench garrisons and work parties. Operating just behind the patrols, but usually outside friendly wire, were the listening posts (represented as A1-A4). Like patrols, listening-post work was normally conducted at night. Further to the rear were trench observers, snipers and sentries who kept watch during the day and night. Ideally, patrols, observers, sniper teams, listening post men, trench sentries, and others worked together, confirming and verifying reports, and guarding against surprise. Knowing that a watch was kept, no doubt, also gave the men in the trenches some degree of comfort, and let them catch up on some much needed rest.

Compared to 1918, the battles of 1915-17 were highly rigid in their planning and execution. In the summer of 1915, for example, the British IV Corps advised the Canadians preparing to assault at Givenchy that "The air photographs and large scale maps now available admit of the plan of operation being worked out in very great detail previous to the attack, and under present conditions in which communication is so

Figure Two – Battalion-level Intelligence Gathering, March 1916



Legend

A1-4: Listening Post (LP) Line. Nine men per post on three man shifts, and placed in or behind obstacles (shell holes, ditches, walls). Distance out: 75 - 125 yards.
B1-4: Trench sentries, each with a relief that sleeps by him, connected to LP by cord or telephone wire. Wire connected to alarm to attract sentry's attention.
C1-4: Trenches or ditches used in extreme light or in local conditions where posts further forward are inadvisable. Also used by support groups or on nights that extra observers are required.
W1-3: Lateral tug wires.
D1-2: Patrols. Only one goes out at a time. All posts informed. All advanced patrolling performed by regular scouts.
B1-A1; **B2-A2**; **B3-A3**; **B4-A4**: Tug lines from LPs to sentries.

difficult, it is essential that this should be done by the Commanders concerned who must satisfy themselves that every detail has been considered."[19] The British document "Principle Points to be Attended to in Making Preliminary Arrangements," first issued after the Battle of Loos in September 1915, declared that "Each attack must be thought out in every detail, and all arrangements worked out beforehand as completely as possible." Everything, from artillery plans, to signal arrangements, to the timing that troops captured their objectives, was determined in advance.[20]

These years saw the perfecting of the set-piece assault. By their very nature these attacks left little room for junior officer and other rank initiative, as they were elaborately planned affairs in which commanding officers and their staffs made all major tactical decisions in advance. They also planned each phase of the assault to the minute. In these years communications, counter battery fire and tactical training were simply too brittle and under-developed to leave the fate of an advance to junior officers and other ranks – and so the need for elaborate pre-battle planning. The fact that battalion and higher commanders could not control the action once it began reinforced the need for minute planning prior to assaults.[21] Stated another way, commanders, unable to control the action while it raged, sought to control the fighting in advance by planning operations to their fullest in the relative calm of normal trench warfare. In such a world, pre-battle intelligence, and the intensive planning it permitted, restored to commanders some degree of control over chaotic battlefields.

For the Canadians the zenith of such top-down control occurred at Vimy Ridge in April 1917. As is well known, that assault was meticulously planned to the finest detail. Men learned by rote when and where to go on a minute by minute basis. The 76th Battalion's orders offer a case in point. The movements of its companies were precisely timed. According to orders, at sixty minutes before Zero Hour the troops were to begin arriving at the jump-off trenches. At thirty minutes before Zero all ranks were to be in position. At Zero the advance was to begin, and seventeen minutes later "C" and "D" Companies were "to take up sheltered positions behind [specified] craters." Twelve minutes after that "A" and "B" Companies were to "take objectives and commence consolidation." Sixteen minutes later, or forty-five minutes past Zero, "C" and "D" Companies were to move forward, followed at Zero plus seventy-nine minutes by taking and consolidating their assigned objectives.[22] There was no margin for error or delay in these instructions, nor was time allowed for overcoming any unforeseen difficulties; it was all matter-of-fact, and precisely pre-calculated. Obstacles were removed during the pre-battle planning stage. Timetable tactics, in effect, greatly reduced command confusion, because all foreseen contingencies and difficulties were accounted for in advance of the attack – an accounting based on a massive quantity of pre-battle intelligence.

Pre-planning and intensive rehearsals over replicas of enemy terrain in the weeks before Zero burned into the minds of attacking troops their role in up-coming fights. In this way, should communications fail, as they likely would, or some other difficulty arise to the point where rear area officers lost touch with the progress of their units, the attack would not necessarily falter and die. Each day, as new intelligence came in, the models were up-dated to reflect the latest changes in the German defences and the intervening terrain. At Vimy Ridge, as we have seen, plans for the assault – one that would see all four Canadian divisions attacking at the same time for the first time – were extremely thorough. Intelligence gathering took weeks and months to complete. The 7th Brigade's report titled "Information regarding German Signal Service," of 2 April 1917, for example, outlines the German communications system. Its simple description belies the enormity of the task. "Thus, summarizing the information, it has been possible to work out the German system of telephonic communication right from the front line to Regimental and Divisional Headquarters, and this is one of the most valuable items of information required for our operations. Their destruction will seriously inconvenience the enemy."[23] A measure of the intelligence effort involved in planning can also be seen in the 1st Division's preparation of a 1/2,500 scale map of its sector that it up-dated each day. This map was in addition to all the army issued maps also available to the Canadians. The 1/2,500 scale map, however, was far more detailed, showing all the German trenches along with their German

names (obtained from a captured map), all known trench mortar and machine gun emplacements, dugouts, observation posts, and so on. Airplane photographs and ground observation also proved valuable for accumulating this detail. According to a divisional report "This Map was subsequently proved to be very accurate and was of immense value to all Units." It was also used to prepare a full-scale practice course taped out over ground similar to that which the Canadians would soon be assaulting. On this practice ground

> Every trench was shown by tape and flag, numerous "Name Boards" being put up showing the German name; trench mortar emplacements and machine gun emplacements, Battalion, Company, and Signalling Headquarters were all marked on the ground. All Units, Infantry, Engineers, and F.O.Os. [Forward Observation Officers] that were to go over in the attack were practiced in turn, and in conjunction with each other over this Course...
>
> In addition...a Plasticine Model on a Scale of 1/5,000 was prepared for the Division by an Intelligence Officer at the First Army Headquarters, assisted by a Draughtsman of the Division. This Model was set up in a Hall at Divisional Headquarters and studied by all ranks, Artillery, Machine Gunners and Infantry.[24]

Captain James Belton and Lieutenant E.G Odell, in their book *Hunting the Hun*, recalled: "When we reached our training areas, we saw hundreds of yards of white tapes two inches wide, stretched out before us. These tapes represented to us the outline of the German trenches which we were to attack and capture on Vimy Ridge. They lay on the ground in exactly the same position that we would later find the German trenches."[25] Each division made similar preparations, and the value of these training courses to the final victory cannot be overstated. The 3rd Division, in its after-action report, said that with only one exception

> all the objectives were gained and consolidated, with comparatively slight loss, in practically the identical manner and time that had been repeatedly practiced over a facsimile of the trenches. Every man and Machine Gun arrived in the appointed place, there was no loss of direction, and the consolidation of the advanced posts and defensive line was carried out precisely as practiced.[26]

Vimy Ridge was not the only operation where models and replicas were used. The Canadians also used them prior to their assaults at Mount Sorrel in June 1916, along the Somme in the autumn, at Hill 70 in August 1917, and at Passchendaele in the following October and November. At Hill 70, as at Vimy Ridge the previous April, the Canadians taped out practice courses on ground similar to that they would cross on Z-Day. The 1st Division's course was made on a four-fifths scale. Some of the information for building it came from local inhabitants, but most came from airplane photographs, ground surveillance and patrols. The course depicted every German trench by tape and flag. Again, "Name Boards" were put up showing the German identified trenches and positions, while "trench mortar and machine gun emplacements, Battalion, Company, and Signalling Headquarters were all marked on the ground." Miniature models of the area were constructed as well. The 2nd Brigade built one such model on a scale of 1:40 at its training school. In addition, an intelligence officer with the 1st Army prepared a plasticine model of the area on a 1: 5,000 scale, and invited the Canadians to study it. From these courses and models the Canadians, with British assistance, worked out solutions to specific tactical problems they would face during the advance.[27]

Such detailed planning was not just for the benefit of commanders and their staffs, though, as it also helped the lower ranks reach their objectives. Sergeant McClintock recalled: "It is interesting to note how every attack nowadays, is worked out in advance in the smallest detail, and how everything is done on a time schedule. Aerial photographs of the position they are expected to capture are furnished to each battalion, and the men are given the fullest opportunity to study them." Everybody had "certain work to do and is instructed and re-instructed until there can be no doubt that he has clear knowledge of his orders." In addition, rehearsals and study, all based on the latest intelligence, helped each man "understand the scope and purpose and plan of the whole operation, so that he will know what to do if he finds himself with no officer to command." All ranks had to "know what to do and how to do it," and to think for themselves and "'carry on' with the general plan," even if all the officers and NCOs became casualties. McClintock remembered his first experience raiding the enemy lines and how "Once we started, we were neither fearful, nor rattled. We had drilled so

long and so carefully that each man knew just what he was to do and he kept right on doing it unless he got hit," and this despite the noise, the stench, the shelling and the dead bodies the assaulting troops stumbled over. Indeed, he recalled that the German trenches he entered during one raid "were practically just as we had expected to find them...They were so nearly similar to the duplicate section in which we had practiced that we had no trouble finding our way in them." McClintock credits two acts that made it possible to carry out orders.

> One was the momentary quickening of the blood which follows a big and unaccustomed dose of rum and the other was a sort of subconscious, mechanical confidence in our undertaking which was the result of the scores of times we had gone through every prearranged movement in the duplicate German trenches behind our lines. Without either of those influences, we simply could not have left shelter and faced what was before us.

There was still tremendous chaos at the front end, to be sure, but careful planning helped the troops keep their heads in environments where they should have gone mad. This is not to say that soldiers were not frightened – that would be absurd, "Thinking men could not help but be afraid." There was comfort, however, in knowing that plans were well worked out in advance, and based on the most complete and thorough intelligence possible.[28]

While it seems obvious that intelligence played an important role in Canadian Corps set-piece attacks, the lack of intelligence also had repercussions. At the Battle of Second Ypres in April 1915, the Canadians and their allies were caught completely off guard by the German assault and their use of poison gas, even though there was ample evidence to show that such an attack was imminent. On 14 April, eight days prior to the German offensive, the Canadians learned from the British V Corps of the possibility of a German gas attack. The next day the corps informed the 1st Canadian Division that it was "not possible to test its [the report of a possible poison gas attack] credibility but certain facts tend to corroborate it. The Corps Commander directs that all precautions are to be taken which would be taken if its credibility were established." Some of the clues offered as proof of a possible attack included reports that the Germans had brought up additional reinforcements and artillery. The Corps' note ended with a warning that "It is possible that the attack may be postponed, if the wind is not favourable, so as to blow the gases over our trenches."[29] Other warnings arrived at the British and French headquarters. A German deserter taken by the French on the thirteenth gave the details of the proposed attack, although the story of a second deserter captured by the French a few days later offered contradictory information. This, along with the Royal Flying Corps' (RFC) failure to observe any inordinate German activity, and the failure of the German assault to materialise as expected during the night of 15-16 April, caused the Allied high command to relax its vigilance. The warning that the Germans required a favourable wind – something that did not occur on the original assault date – was forgotten. By April twenty-second the British had switched their attention to another portion of the line. The Canadians, still being amateurs at the time, took their cue from the British and also stopped worrying about the possibility of a poison gas attack. The result, as is well known, was the near loss of the Ypres Sector and a sixty-percent casualty rate amongst the Canadians caught in the German snare.[30]

During the Canadians Corps' first trench raid in November 1915, the lack of intelligence helped prevent the 5th Battalion's raiding party from entering the German trenches. Fortunately for the Canadians a second raiding party, comprised of men from the 7th Battalion, more than made up for the fifth's short-coming. Assaulting troops from the 5th Battalion stumbled onto a previously undiscovered water-filled ditch that blocked their path. Rendering passage more hazardous was a wire entanglement placed at its bottom. Crossing it was impossible, so the raiders had to content themselves with lobbing a few grenades into the German trench and making a hasty retreat.[31] At the Somme, in October 1916, General Arthur Currie, commander of the 1st Canadian Division, pointed to poor intelligence work as a contributing factor in his command's defeat at Regina Trench. Patrol reports, he said, provided a completely erroneous picture of the actual conditions along the front by suggesting that the artillery had effectively cut the German protective wire. From these reports Currie "came to the conclusion that while a certain amount of wire was to be expected, it would offer no serious

obstacle. The attacking troops were warned of this and additional wire cutters served out as an extra precaution." Events proved the intelligence wrong. Currie wrote:

> Reports on the condition of the wire were unsatisfactory. Observation on the wire was poor from the position occupied by our Infantry Observers and the limited time at the disposal of the Division did not permit of a protracted search for suitable O.Ps. [observation posts]. Patrols were sent out, but owing to [the rapidity of trench] reliefs these men never became thoroughly acquainted with the ground and their reports have since been proved to be very inaccurate. Owing to weather conditions Aeroplane reconnaissance photos were not available.

In addition, Currie noted that patrolmen were inexperienced due to the large influx of green troops necessary after the heavy casualties suffered in previous engagements. In the difficult fighting that followed, attacking troops from some units were caught on the wire and mowed down by enemy machine guns. In other units the wire drove the men into the trenches where they tried to make their way to their objectives by bombing their way forward from trench to trench. They were unprepared for this type of close fighting, however, and soon ran out of grenades, leaving them nearly defenceless. German counter attacks forced them back to their start lines.[32]

Despite these kinds of setbacks, most operations saw officers and men praise the intelligence organisation's efforts and acknowledge its importance to winning trench warfare. After its part in the fighting for Regina and Desire Trenches during the later stages of the Somme battle, the 87th Battalion declared:

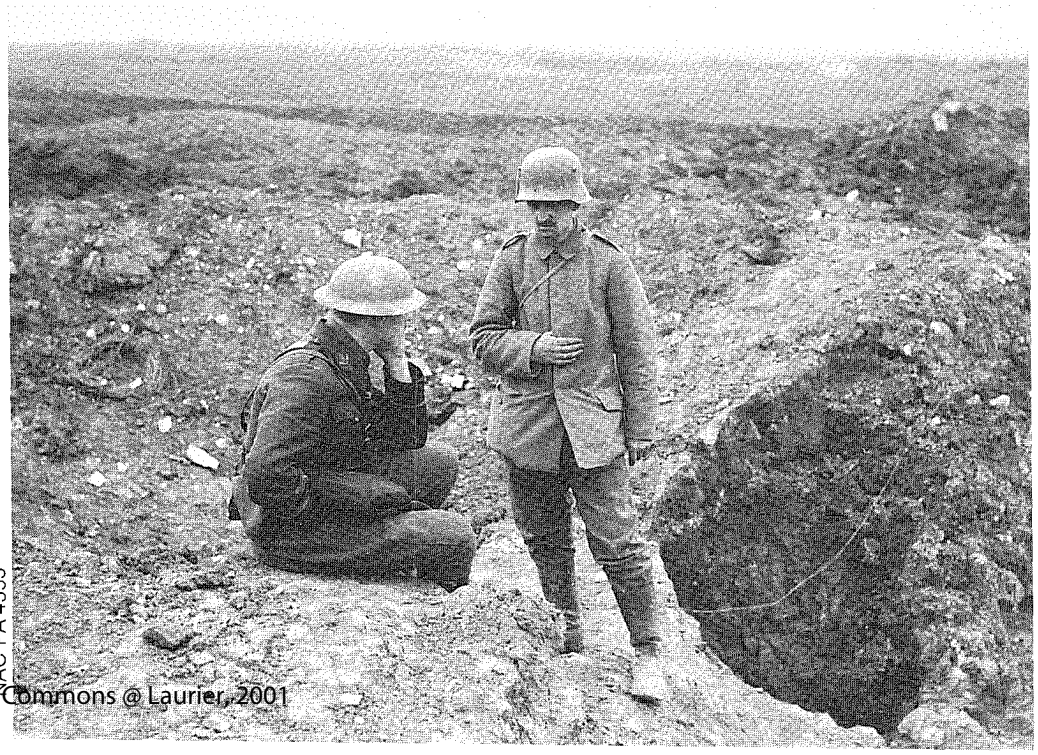
> In the attack of October 21st we had great success...partly due to the fact that everybody was well acquainted with the landmarks. A week before going up we made a model on a piece of ground in our camp of the area which we should have to go over. This showed all contours, villages, trenches, C.T's [communication trenches] and other landmarks and as every man in the Battalion had been instructed in it and studied it the consequence was that once in the area they felt that they knew where they were.[33]

Of course, the model was based on the latest intelligence. The 11th Brigade, too, was highly laudatory of observation work during that same assault.

> An Observation Post was established in a commanding position behind and connected to the Brigade Commander by telephone. During the first operation [October twenty-first against Regina Trench] the Brigade Intelligence Officer kept the G.O.C. [General Officer Commanding] informed minute by minute of the progress of events and as a result, on several occasions artillery action, promptly ordered, nipped off budding counter attacks.[34]

After their phenomenal success at Vimy Ridge in April 1917, the Canadians heaped further

A Canadian officer questions a captured German soldier, May 1917.



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praise on their intelligence service. The 3rd Brigade reported:

> The extraordinary success that the operation met with, running as it did absolutely to time-table, emphasized the value of the training received; the artillery preparation and co-operation, and the individual self confidence of every man. Officers and Non-commissioned Officers recognized the ground, and found that what the Intelligence had told them that they might expect to find in the way of dugouts, trench mortar emplacements, machine gun emplacements, etc., etc., they most certainly did find.[35]

General Currie, when summarising his division's role in the battle, made this assessment of the intelligence contribution:

> The data had been very carefully arranged by the Intelligence Branch of the Division and proved very accurate and reliable. This fact enabled targets of real value to be engaged by the Heavy Artillery with the best results and the minimum expenditure of ammunition compatible with the task. The accurate location of dugouts taken from a study of aeroplane photographs was of great value in selecting positions of Battalion Headquarters and Advanced Report Centres as the advance progressed.
>
> The intelligence gained of the habits of the enemy so as to enable us to harass him with the greatest result, and the accurate information gained of the area over which we had to attack was, I consider, one of the main causes of our success.[36]

Similar praise for intelligence work was recounted in the other units and formations in this and other actions throughout the war.[37]

So far this article has explored the importance of pre-battle intelligence. However, intelligence gatherers continued to collect information during operations. For the most part, it was used for monitoring the progress of decisions already made in the months, weeks and days leading up to the advance, and not so much for making important command decisions as the fighting unfolded. There were, though, some occasions where the information gathered was vital for immediate decision-making, encouraging commanders to push forward their reserves or to continue pressing the enemy. During the 26 October 1917 assault at Passchendaele, for example, troops from the 3rd Division were ordered to capture a promontory called Bellevue Spur. It was an important piece of high ground needed as a base for future assaults against Passchendaele Ridge. At one point, when it looked as if the assault had failed, brigade observers from the left attacking brigade "insisted that men of the Right Brigade were still to be seen on the Crest of BELLEVUE," even though "all other reports indicated that the right Brigade troops were back in their J.O.T. [jumping off trenches]."[38] "This information at that time was invaluable," for it meant the assault could still be salvaged. Units from the supporting reserve battalion were sent forward to help clear up the situation and to join forces with the men holding out on the ridge, with the result that "the Spur was completely in our possession by the afternoon."[39] Incidentally, this example also demonstrates the importance of brigade observers as intelligence gatherers during an action, and showed that the effort involved in maintaining them was well worth while.

By March 1918, when the Germans launched their long-awaited offensive, tactics, unit-level firepower, logistical support, communications, and gunnery technique had all improved dramatically since 1916. The result was a more fluid battlefield, one that saw greater ebbs and flows, deeper penetrations, and a more sophisticated, all-arms approach to operations. Moreover, the Germans launched their attacks in rapid succession to take advantage of their new stormtroop tactics and the disruption they caused Allied command centres. During the 100 Days Campaign, between 8 August and 11 November 1918, the Allies reversed this trend, and devastated the German Army in a continuous series of blows that eventually forced the German capitulation. The Canadians took part in these counter offensives by spearheading the British advance, and by launching no less than seven major offensives.[40] The leisurely pace at which intelligence had been collected prior to such battles as Vimy Ridge ended as the need for speed increased. Fortunately, by mid 1918 the intelligence system was so proficient that it could and did collect a tremendous amount of information within relatively short periods of time. In the crossing of the Canal du Nord at the end of September, the pre-battle counter battery intelligence proved exceedingly complete and accurate. In its after-action report the CBO wrote that "In order to make certain that at least all known and suspected hostile batteries were neutralized it was found that 113 [enemy gun]

positions had to be covered [by counter battery fire]." Knowing that some of these 113 gun pits would be vacant on Zero Day, the Counter Battery Office relied on the services of the Royal Air Force (RAF) squadron attached to the corps to inform it as to which pits were actually active during the assault. The RAF was equal to the task, and kept the batteries up to date on German artillery movements. This let the heavy batteries save ammunition, while concentrating on targets where active enemy batteries really were situated. After the battle the CBO concluded, rather unassumingly, that "Apparently the appreciation of the hostile artillery situation had been substantially correct for there were only six batteries active in positions which had not been included in the neutralization scheme" prepared before the battle. In effect, nearly every German gun had been located prior to Zero Hour and targeted for destruction.[41] With such a wealth of information success in the field came all the easier.

Nevertheless, the rapidity with which operations were now launched, and the Germans' better use of camouflage, dummy positions and tactical defensive layouts meant that come Zero Day less was known with certainty about the German lines than was the case in previous years' battles. This meant that there might be more undiscovered obstacles facing assaulting troops or more undisclosed German batteries able to pound the infantry crossing no-man's-land. As a result of intensive training programmes undertaken in the early summer, though, the tactical acumen of the average fighting man had greatly improved since 1916-17, while the firepower of his unit had increased dramatically.[42] Unknown obstacles, be they wire entanglements or German machine gun posts, were overcome by men confident in their abilities to carry on without their having to wait for tank and artillery support. The Battle of Amiens beginning on 8 August 1918, perhaps more than any other Great War battle, shows that well trained men could successfully confront an entrenched enemy in largely unknown ground and still out manoeuvre them.

The Canadians had moved to the Amiens Sector in such secrecy, and in such haste, that most commands only had time for a cursory examination of the ground and their objectives before going over the top. In some cases the attacking troops, having travelled some 50 to 60 miles to get to the area, only arrived with a few hours to spare. However, the decentralisation of tactical decision-making practised in the summer meant higher command could now rely

German prisoners and wounded Canadians coming through the mud during the Battle of Passchendaele, November 1917. NAC PA 40126

on the fighting prowess and tactical skill of their men, rather than on top-down, minute-by-minute plans of the Vimy Ridge variety. Planning remained highly centralised, to be sure, and orders were still packed with details gathered by the intelligence organisation, but their execution was left more and more to the men doing the actual fighting. Reports on the action make this plainly clear. A 7th Battalion report noted that artillery preparation for Amiens had been excellent. "As far as this Battalion was concerned, isolated Machine Guns and Rifle fire, were all that had to be dealt with...It was amply demonstrated that the training in open warfare undergone whilst the Corps was in rest was all to the good, by the rapidity with which they were overcome with very light casualties to ourselves." The 10th Battalion echoed these sentiments when it wrote that "the value of the recent training in open warfare was very apparent, especially the methods of overcoming machine gun opposition, and the tactical exercises which involved lengthy advances over more or less unknown territory, were very useful."[43] The 5th Brigade described how on the second day of the battle the German machine gun nests still surviving:

> were dealt with entirely by manoeuvre. Small parties of scouts followed by Lewis Guns worked up ditches, sunken roads and other dead ground until the enemy's Machine Guns were put out of action or forced to retire by enfilade fire from a flank. When this had been accomplished a signal was given to the Infantry, who meantime had remained under cover, that they could advance. Successive positions were dealt with in this manner without incurring undue casualties.[44]

Over in the 4th Canadian Division "The enemy had a very strong Machine gun Defence organized in the woods...[This] opposition was overcome by the successful employment of the combined action of one Infantry Company of the 78th Battalion, an 18 pdr. Battery, 4 or 5 Tanks and a 6 [inch] Trench Mortar, resulting in many casualties to the enemy, the capture of 20 prisoners and 12 Machine guns."[45]

Information, as well as tactical proficiency, was crucial to men advancing across no-man's-land in the new combat environment. But the need for information placed great stress on available communications. Fittingly, by the summer of 1918, communications had greatly improved.[46] On those occasions where previously undisclosed enemy artillery was pounding an advance, or when machine gun nests and wire entanglements were unyielding, the intelligence organisation quickly transmitted the news and nature of the hold-ups to those service arms that could best provide assistance. An assortment of ground observers (the artillery's Forward Observation Officers, scouts, and infantry observers), along with observers from the RAF, the CCSS, and the Army organised sound rangers, among a host of others monitoring the advance, relayed an unending stream of news to the Counter Battery Office, tank headquarters, and other commands capable of affecting the front line situation. Any hold-ups were quickly dealt with, and usually by the crushing blow of concentrated artillery fire.

By 1918, most of the intelligence effort that occurred before and during battle concerned the needs of the artillery. Andrew McNaughton, the man who organised and ran the CBO until the last weeks of the war, recalled later that "the whole of our intelligence system was centred on those who had the means at their disposal to take immediate and effective action."[47] Those with "the means at their disposal" were the gunners who, for the most part, were under corps and divisional control.[48] Since the artillery could break up massing enemy troops preparing for counter attacks, disrupt the arrival of enemy reinforcements, ammunition, and food supplies, silence and harass enemy guns, and eliminate obstacles and pernicious pockets of enemy troops and machine gun nests, it was the arm that most readily influenced the course of battle, and was most needful of up-to-date intelligence. Reliable communications were obviously vital, but so too were the men and special teams gathering the information in the first place. Their efforts bestowed enormous freedom of action on corps, divisional and artillery officers who now had sufficient information for taking advantage of opportunities to inflict damage on enemy troops and positions, and do so while battles developed. The successful break-up of German counter attacks, for example, was a direct result of either careful study of pre-battle intelligence regarding normal German routes of approach, billeting areas and likely assembly areas, or of word reaching the gunners during an attack that German troops were seen massing at some point.[49] During the fighting for Valenciennes in

the closing days of the war, "Great importance was attached to the harassing of all important routes of approach, sunken roads and valleys;" and in order "to give the infantry every possible assistance at what was expected to be critical parts of the battle, proposed assembly areas of the enemy were subjected to timed concentrations from the counter battery artillery." A post battle review of the artillery's part at Valenciennes "showed that very valuable results had been obtained." Thanks in part to accurate intelligence on such positions, "the enemy's supplies of ammunition and reinforcements [were] evidently greatly interfered with. The casualties to the enemy's transport were particularly high in the sunken roads...In some cases the road was practically blocked by the destroyed wagons and dead animals."[50]

The RAF played an important intelligence role throughout the 100 Days. Due to the speed with which pilots could deliver news to the gunners, the importance of the corps squadron as a source of counter battery and other intelligence continued to expand. Intelligence gathered by the RAF usually arrived at the CBO within minutes of its collection. This meant gunners could continually harass German troops and batteries. One Counter Battery Office memorandum explained: "In the moving [battle] the aeroplane forms the greatest source of intelligence. Its advantage being that reliable information regarding the disposition and movement of enemy troops and the strength and grouping of the Hostile Artillery can be quickly delivered to the General Staff."[51] According to Lieutenant Colonel H.D.G. Crerar, who replaced McNaughton at the CBO during the last weeks of the war, the Corps Squadron was "very often the only reliable source of information" on the location of hostile batteries, and that "the effective neutralizing of hostile artillery fire at critical moments may depend almost entirely upon the work of the Corps Squadron."[52] At Valenciennes "special importance" was attached to the Corps Squadron's role in locating hostile batteries on the day of battle. During that action the Germans employed "roving batteries" that moved across the front as needed. These were difficult to locate by ground level means, so aerial observers played a crucial role in finding them through direct observation. Aerial photography was useless for tracking such guns, as the Germans did not dig pits for them, or keep them long in one spot. During the battle, aerial observers were therefore called upon to locate all those guns that "had been impossible to locate definitely prior to zero hour on account of their having either remained silent or been deployed in new positions." A CBO after-action report declared that "On the whole the results obtained [by the Corps Squadron] were most gratifying...Evidence from all sources substantiates the fact that [German artillery] shelling at zero and throughout the day was in no way a menace to the advance of our infantry...A great deal of the [success of the] neutralization programme for the day must be attributed to the pilots and observers of No. 5 Squadron." Indeed, so effective were the pilots at Valenciennes that "it was possible to follow the enemy's artillery manoeuvres throughout the day."[53]

The First World War saw technological advances that completely altered the face of battle from what had been expected. Trenches, barbed wire, machine guns and artillery stopped armies in their tracks and forced men to dig into the earth. The resulting deadlock offered a unique opportunity for the development of a tactical intelligence organisation. The closeness of the opposing lines, and the power of the defence, demanded that they be constantly observed. With machine guns and artillery capable of killing thousands of men in a single day and checking attacks, sometimes before they even started, with relative ease, it was crucial that the enemy's position and habits be studied in order for thorough planning to take place. The shock of modern warfare, combined with unreliable communications and an ever-expanding battlefield, also meant that commanders charged with preparing and waging battle were bound to lose control of the action once it began. The development of the set-piece assault, however, helped prevent this from happening on a regular basis. As the name implies, set-piece attacks tried to account for all contingencies and eliminate all known obstacles in advance of the infantry going over the top. Such intensive pre-planing consumed a tremendous amount of information. Early in the war the Canadians were unprepared for the enormity of the task, and were without intelligence units in their front-line commands capable of collecting the required details. By 1916 this had begun to change, as battalions

and brigades, for example, began employing specialised scouting units. The year 1917 saw further refinements and adaptations, as well as the perfecting of the set-piece assault. That year also witnessed the development of an intelligence organisation that could quickly retrieve, verify and manage the information pouring into the various intelligence centres. Fine-tuning continued into 1918, and during the 100 Days Campaign General Currie, the commander of the Canadian Corps since the summer of 1917, believed that the intelligence service possessed greater "elasticity than hitherto" and was "adaptable to conditions as they arose." With such flexibility, of course, the Canadians could amass an incredible amount of information on short notice and over great distances. As a result, the Canadian Corps was continuously supplied with vital information for making plans and preparing movements even though the tactical environment was far more fluid than it had been only a year earlier. Such versatility, in turn, helped make it possible for the Canadians to launch a series of attacks that, when combined with those waged by its Allies, smashed the German Army. Certainly, intelligence work was not the only contributing factor to the Corps' ability to win battles, but it was an indispensable ingredient. The Canadians may have entered the First World War without a well-developed or defined intelligence service, but by November 1918, this had been reversed. At the time of the Armistice, wrote Currie, "the Canadian Corps Intelligence Service," was "very complete;" its "system of collecting and co-ordinating information...could almost be categorized as perfect."[54]

Notes

1. Alan Clark's *The Donkeys* (New York: William Morrow and Company, 1962) certainly contributed to the belief that the British high command was incompetent, as did Leon Wolff's, *In Flanders Fields, The 1917 Campaign* (New York: Ballantine Books, 1958).
2. J.E. Hahn, *The Intelligence Service Within the Canadian Corps, 1914-1918* (Toronto: The Macmillan Company of Canada, Limited, 1930).
3. A.F. Duguid, *Official History of the Canadian Forces in the Great War, 1914-1919, Vol.1* (Ottawa: Department of National Defence, 1938); James Edmonds (general editor), *History of the Great War, Based on Official Documents: Military Operations, France and Belgium* (London: HMSO, 1920-1949); and G.W.L Nicholson, *The Official History of the Canadian Army in the First World War: Canadian Expeditionary Force, 1914-1919* (Ottawa: Queen's Printer, 1962).
4. See A.G.L McNaughton, "The Capture of Valenciennes: A Study in Co-ordination," *Canadian Defence Quarterly* 10.3 (April 1933), pp.279-294; "Counter Battery Work," *Canadian Defence Quarterly* 3.4 (July, 1926) pp.380-391; and "The Development of Artillery in the Great War," *Canadian Defence Quarterly* (January 1929), pp.160-171; H. Hesketh- Prichard, *Sniping In France: How The British Army Won the Sniping War in the Trenches* (E.P Dutton and Company, no date; reprint Lancer Militaria, 1993); John A. Innes, *Flash Spotters and Sound Rangers: How They Lived, Worked and Fought in the Great War* (London: Allen & Unwin, 1935); A.F. Brooke, "The Evolution of Artillery in the Great War," *Journal of the Royal Artillery* (1924-6); and H. Winterbotham, "British Survey on the Western Front," *The Geographical Journal* 53.4 (April 1919), pp.253-276.
5. See John Ferris, "'Before Room 40': The British Empire and Signals Intelligence, 1898-1914," *Journal of Strategic Studies* 12.4 (December 1989), pp.431-457; "The British Army and Signals Intelligence in the Field During the First World War," *Intelligence and National Security* 3.3 (October 1988), pp.23-48; David French, "Sir John French's Secret Service on the Western Front, 1914-1915," *The Journal of Strategic Studies* 7.4 (December 1984), pp.423-440; and Yigal Sheffy, *British Military Intelligence in the Palestine Campaign 1914-1918* (London: Frank Cass, 1998).
6. See Bill Rawling, *Surviving Trench Warfare, Technology and the Canadian Corps, 1914-1918* (Toronto: University of Toronto Press, 1992); Stephen J. Harris, *Canadian Brass: The Making of a Professional Army, 1860-1939* (Toronto: University of Toronto Press, 1988); Paddy Griffith, *Battle Tactics of the Western Front, The British Army's Art of Attack, 1916-1918* (New Haven: Yale University Press, 1994); Shane Schreiber, *Shock Army of the British Empire. The Canadian Corps in the Last 100 Days of the Great War.* (Westport CT: Praeger, 1997):Tim Cook, *No Place to Run, The Canadian Corps and Gas Warfare in the First World War* (Vancouver: University of British Columbia Press, 1999); and Ian Malcolm Brown, *British Logistics on the Western Front 1914-1919* (Westport, Conn.: Praeger Publishers, 1998).
7. Alexander McClintock, *Best O'Luck: How a Fighting Kentuckian Won the Thanks of Britain's King* (1917. Ottawa: CEF Books, 2000), pp.12, 19.
8. *Ibid*, pp.46-7.
9. *Ibid*, p.26.
10. National Archives of Canada (NAC), Record Group (RG) 9 III C1, Vol.3859, Folder 85, File 8. 1st Brigade to 1st Division, 20 November 1917.
11. This happened during the fighting around Festubert in May 1915. Brigadier-General Arthur Currie, then in command of the 2nd Brigade, could not identify his objective – K.5. – and asked for a delay to reconnoitre the ground. Instead, he was ordered to attack. During the same engagement, Brigadier-General Richard Turner, in command of the 3rd Brigade, sought a postponement in his formation's assault after the discovery of uncut German wire lying across the 15th Battalion's path. Like Currie, he was ordered to attack as arranged. Both brigades failed to secure their objectives.
12. NAC Manuscript Group (MG) 30 E61 (Mitchell Papers) Vol.16, Folder: Western Front, Orders and Instructions,

1914-1915. Lieutenant-General Robertson to 1st Army, 15 March 1915; also 1st Canadian Division to 1st Brigade, 8 March 1915. Michael Occleshaw, *Armour Against Fate. British Military Intelligence in the First World War* (London: Columbus Books Limited, 1989), 37-38.

13. NAC RG 9 III C3, Vol.4021, Folder 50, File 11. GHQ to Armies, 23 February 1915.
14. Figure One is taken from Dan Jenkins, "Winning Trench Warfare: Battlefield Intelligence in the Canadian Corps, 1914-1918" (Carleton University, Ph.D. Thesis, 1999), p.154.
15. For work on the importance of the CBO see A.G.L McNaughton, "Counter Battery Work," *Canadian Defence Quarterly* 3.4 (July, 1926), pp.380-391; J.A. Swettenham's *McNaughton, Vol.1, 1887-1939* (Toronto: Ryerson Press, 1968); and Albert P. Palazzo, "The British Army's Counter-Battery Staff Office and Control of the Enemy in World War I," *The Journal of Military History* 63.1 (January 1999), pp.55- 74.
16. Flash spotting was a technique used by all belligerents to position enemy batteries. Upon seeing a gun flash, flash spotters, employing special equipment and trigonometry calculated the approximate location of the active gun. Flash spotting had its limitations, and was not as accurate as other methods for positioning hostile batteries, but in a moving battle rough locations were better than none at all.
17. See Jenkins, "Winning Trench Warfare," pp.342-4. Other British Corps also developed corps observation teams, but what made the CCSS unique was its control over its own flash spotters. British corps observation teams continued to rely on army controlled flash spotters. By controlling their own flash spotters the Canadian Corps was that much more responsive to changing conditions along the front compared to its British equivalent.
18. Based on Lt. Colonel Odlum's diagram in NAC MG 30 E300 (Odlum Papers) Vol.24, Folder: Trench Discipline, March 1916-April 1918. 7th Battalion to 2nd Brigade, 8 March 1916, and as reproduced in Jenkins, "Winning Trench Warfare," p.89.
19. NAC MG 30 E 300 (Odlum Papers) Vol.23, Folder: Attack operation orders, 1915. IV Corps to 1st Canadian Division, 7 June 1915
20. NAC RG 9 III C3, Vol.4122, Folder 4, File 2. "Principle Points to be Attended to in Making Preliminary Arrangements."
21. Loss of control, and the efforts made to regain it is a theme seen over and over again in planning preparations and in after-action reports. It was a very real problem at the Somme for example. See NAC MG 30 E 300 (Odlum Papers) Vol.19, Folder: Reports, Brigade Orders (11th C.I.B.) December 1916. "Lessons from the Somme." The 75th Battalion made the same claim in its report on the Somme in RG 9 III C1, Vol.3843, Folder 44, File 1. Also RG 9 III C3, Vol.4089, Folder 20, File 4. 4th and 5th Brigade "Lessons Derived from Operations on the Somme"; Vol.4153, Folder 4, File 2. 8th Brigade report on the Somme, December 1916; Folder 4, File 3. Royal Canadian Regiment report on the Somme, 19 November 1916; Vol.4162, Folder 9, File 6. 1st and 5th CMR, "Lessons Learnt From Operations on the Somme"; Vol.4011, Folder 17, File 1. 1st Division to Canadian Corps, 1916.
22. NAC RG 9 III C3, Vol.4237, Folder 3, File 3. 78th Battalion Operation Order No. 63.
23. NAC RG 9 III C4, Vol.4342, Folder 4, File 11. 7th Brigade's "Information regarding German Signal Service," 2 April 1917.
24. NAC MG 30 E 15 (Griesbach Papers) Vol.3, Folder 19. "1st Canadian Division Report on the Vimy Ridge – Willerval – Arleux and Fresnoy Operations April 9th – May 5th 1917."
25. Captain James Belton and Lt. E.G Odell, *Hunting the Hun* (NY: Appleton & company, 1918), p.27.
26. NAC RG 9 III C3, Vol.4146, Folder 9, File 2. 3rd Canadian Division to Canadian Corps, 5 May 1917.
27. NAC RG 9 III C1, Vol.3850, Folder 62, File 61. "Report on the Capture of Hill 70 and Ouits 14 Bis By 1st Canadian Division, 15th August 1917."
28. McClintock, *Best O'Luck:*, pp.31, 33-35, 55.
29. NAC MG 30 E61 (Mitchell Papers) Vol.4, Folder 17. British V Corps to 1st Canadian Division, 15 April 1915.
30. A number of books describe in greater detail the various warning signs that were known by the Allies. See for example: Duguid, *Official History*, pp.212-220; Nicholson, *Official History*, pp.60-61; Daniel Dancocks, *Welcome To Flanders Fields* (Toronto: McClelland & Stewart Inc., 1989), pp.153-155; George Cassar, *Beyond Courage. The Canadians at the Second Battle of Ypres* (Canada: Oberon Press, 1985), pp.58-63; and J. McWilliams and R.J. Steel's, *Gas! The Battle for Ypres, 1915* (St. Catherine's, Ont.: Vanwell Publishing Limited, 1985), pp.11-20.
31. NAC RG 9 III D1, Vol.4676, Folder 3, File 7. Summary of Operations, Canadian Corps, 15-22 November 1915; RG 24, Vol.1825, Folder GAQ 5-66. General Lipsett to "My dear General," 20 November 1915; Nicholson, *Official History*, pp.123-125.
32. NAC MG 30 E100 (Currie Papers) Vol.35, File 159. 1st Canadian Division to Canadian Corps in reference to reasons for the failed assault against Regina Trench on 8 October 1916.
33. NAC MG 30 E300 (Odlum Papers) Vol.19, Folder: Reports, Brigade Orders (11th C.I.B.) December 1916. 87th Battalion report on the Somme, 18 December 1916.
34. NAC RG 9 III C1, Vol.3843, Folder 44, File 1. 11th Brigade's "Lessons From the Somme," 20 December 1916.
35. NAC MG 30 E 236 (Villiers Papers) Vol.3, Folder 5. 3rd Brigade, "Report on Operations, Battle of Vimy Ridge, April 9th, 1917."
36. NAC MG 30 E15 (Griesbach Papers) Vol.3, Folder 19. "Report on Operations Carried Out By The 1st Canadian Division. April 9th-May 5th 1917."
37. In the case of Vimy Ridge, see RG 9 III C3, Vol.4146, Folder 9, File 2. "Report on Operations of the 7th Canadian Infantry Brigade in the Attack on Vimy Ridge From S.22.b.45.17 to S.29.a.55.90, From April 9th to April 12th 1917." In Vol.4051, Folder 19, File 2. "Summary of Operations From April 9th to April 20th, 1917," the 15th Battalion wrote: "The training over the COURSE helped a great deal and the men knew where they were going and the ground layout very well." In addition to these two commands, a number of other battalions prepared reports describing the activities of their intelligence sections throughout the operation. The 13th, 14th, 15th and 16th Battalion reports can be found in Vol.4010, Folder 12, File 5. Other references can be found in my dissertation "Winning Trench Warfare."

38. Their reports were later confirmed by a airplane contact patrol.
39. NAC RG 9 III C1, Vol.3853, Folder 68, File 7. "Intelligence, 3rd Canadian Division, For Bellevue Spur Operations of 26th and 30th October, 1917," 8 November 1917.
40. The Battle of Amiens began on 8 August, while the assault on the Scarpe began on 26 August; the taking of the D-Q Line began on 2 September; the Canal du Nord on 27 September; Cambrai on 8 October; Mount Houy/Valenciennes was taken on 1 November, and Mons was captured on the 11th.
41. NAC RG 9 III C1, Vol.3923, Folder 11, File 5. Counter Battery Office report on Battle of Bourlon Wood, 27 September 1918. An added reason for having reliable counter battery intelligence at the Canal du Nord was that the Canadians packed their narrow front with troops while waiting for Zero Hour. If the Germans had started shelling, the counter batteries were responsible for silencing the German guns in order to protect the infantry.
42. Rawling, *Surviving Trench Warfare*, Chapters 7 and 8.
43. NAC RG 9 III C3, Vol.4053, Folder 24, File 16. 7th and 10th Battalions to 2nd Brigade, 24 August 1918.
44. NAC MG 30 E6 (Burstall Papers) Vol.1, Folder 1. 5th Brigade's narrative of operations.
45. NAC RG 9 III B1, Vol.2276, Folder 0-2-30, Vol.1. "4th Canadian Division Narrative of Operations, Battle of Amiens, August 8th to August 13th, 1918," prepared 10 September 1918.
46. Bill Rawling, "Communications in the Canadian Corps, 1915-1918, Wartime Technological Progress Revisited," *Canadian Military History* 3.2 (Autumn 1994), pp.6-21.
47. A.G.L. McNaughton, "Development of Artillery in the Great War," *Canadian Defence Quarterly* 4 (1929), pp.160-171.
48. The corps retained control of most of the guns throughout the set-piece phase of assaults, with control reverting to divisions once the consolidation phase began.
49. A.G.L. McNaughton, "The Capture of Valenciennes: A Study in Co-ordination," *Canadian Defence Quarterly* 10.3 (April 1933), pp.286, 291; G.W.L. Nicholson, *The Gunners of Canada. A History of the Royal Regiment of Canadian Artillery, Vol.1 1534-1919*, (Toronto: McClelland & Stewart, 1967), p.369.
50. NAC MG 30 E157 (Crerar Papers) Vol.22, Folder 3. Counter Battery Office "Notes on Counter Battery Support in Capture of Mont Houy By the Canadian Corps on the 1st. November 1918," prepared 3 February 1919.
51. NAC RG 9 III C1, Vol.3922, Folder 7, File 4. Counter battery office to Canadian Corps Heavy Artillery, 21 November 1918.
52. NAC RG 24, Vol.1832, Folder GAQ. 8-15e. "Organization and Procedure of Counter Battery Office Canadian Corps Artillery," 25 January 1919.
53. NAC MG 30 E157 (Crerar papers) Vol.22, Folder 3. "Notes on Counter Battery Support in Capture of Mont Houy by the Canadian Corps on the 1st. November 1918," 3 February 1919.
54. Arthur Currie, "Historical Resume of Canadian Corps Intelligence," in J.E. Hahn, *The Intelligence Service Within the Canadian Corps, 1914-1918* (Toronto: The Macmillan Company of Canada, Limited, 1930), p.xxi.

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