

# A Lesson in Success

## The Calonne Trench Raid,

### 17 January 1917

**Andrew B. Godefroy**

*"I hope that the Canadians are not in trenches opposite you, for they on the darkest night jump suddenly into our trenches, causing great consternation and before cries for help can be answered disappear again into the darkness..."<sup>1</sup>*

- From a letter found on a captured German soldier, 1917.

The Allied armies slugged it out on the Western front for nearly four years before finally achieving the breakout sought since November 1914. The four-division strong Canadian Corps led this "spearhead to victory." Its commander was Lieutenant-General Sir Arthur Currie, and his corps was commonly referred to as the "shock troops" of the British Expeditionary Force and as "the enemy's *elite* soldiers" by the German high command. This reputation stemmed from the Canadians' impressive record of success in raiding the German lines throughout the war. The Canadian Corps' flexibility, and initiative, the aggressiveness of its soldiers, and their ever improving skills of fire and movement continually added to the growing legend of Canadians being masters of the art of the trench raid. One operation in particular, a raid against the German lines along the Lens-Bethune railway northeast of Cite Calonne on 17 January 1917, was almost flawless in its planning and preparation, and near text-book in its execution and resulting effect.

The trench raid was by no means a Canadian invention, but as historian Daniel G. Dancocks once wrote, "If [the Canadians] had not initiated this form of warfare, they certainly elevated it to an art form."<sup>2</sup> Trench raiding had originated as part of the British Expeditionary Force (BEF) policy of maintaining the offensive *esprit de corps* and avoiding the morbid monotony of trench warfare by constantly harassing and demoralizing the enemy. The British, "in contrast to the French, who when not engaged in a major

offensive tended to observe an unofficial truce,...emphasized the necessity for continual aggressiveness in defence."<sup>3</sup> In February 1915 the Princess Patricia's Canadian Light Infantry raided the German lines opposite them and thus undertook the first operation of what would later become a trademark of the Canadian Corps.<sup>4</sup> The Canadian staff soon realized the advantages of trench raiding, and after the second battle of Ypres (April 1915) they implemented a vigorous raiding policy.

The Allies spent the first months of 1917 in extensive planning and preparation for the spring offensive. At the end of the previous year the French high command had decided to make a strong thrust across the Aisne rather than continuing the battles of attrition on the Somme. In addition, General Nivelle, commanding the French, asked Field Marshal Haig to continue with the planned attack south of Arras, starting a few days in advance of his own main attack. Haig agreed, but insisted that his attack extend north to include the Vimy Sector. Haig was convinced that only strong pressure could force the Germans off the ridge. In January 1917 this area fell within the British First Army Sector and was sitting opposite the Canadian Corps.<sup>5</sup>

Extensive raiding by Canadian troops preceded the attack on Vimy Ridge. Almost every battalion was required to engage in some activity to gain as much information about the enemy and familiarize its own troops with the ground.

Played out like miniature versions of the actual assault, by 1917 raids were mounted in daylight rather than under the cover of darkness like the year before. Since allied troops were fighting from west to east, they also enjoyed a few hours more twilight behind them while the rising sun silhouetted the German positions. Furthermore, by 1917 raiding parties had increased dramatically in size compared to the handfuls of men who undertook earlier raids. Raiding and patrolling also kept the Germans nervous, forced them to abandon their own forward posts and patrolling, and limited their ability to detect an attack which was being prepared against them. A series of raids were carried out along the Canadian front right up until the day before the assault on Vimy Ridge, constantly testing the German defences and keeping German morale low.

The most important factor influencing the raiding concept was the geography of the western front. Geography had a direct influence on survivability because the terrain provided little in the way of natural obstacles for either side to take advantage of. Much of Belgium and Flanders, where the Canadian Corps fought its battles, consisted of low ridges, rolling hills, or wide expanses of flat open terrain. The many wooded areas had been reduced to little more than a collection of burnt stumps by continuous shell and machine gun fire. With little or no natural cover, soldiers were forced to dig themselves into the ground to survive. Thus, within a short while the whole western front consisted of a series of interconnected trenches protected by row upon row of barbed wire entanglements and machine guns. Artillery, machine guns, or snipers meticulously covered every avenue of advance. In between the German and Allied armies was a narrow strip of cratered and desolate terrain that was commonly referred to as "no man's land" due to the perception that it was impossible for anyone to survive outside the trench lines for very long.

Trenches developed as a result of the need for creating defensive positions from which to repel enemy attacks and counter-attacks. Both sides created an extensive series of field works, well supplied with small arms, machine guns, and supported by artillery, which led to the inability of either the British or the Germans to continue to manoeuvre. Manoeuvrability was

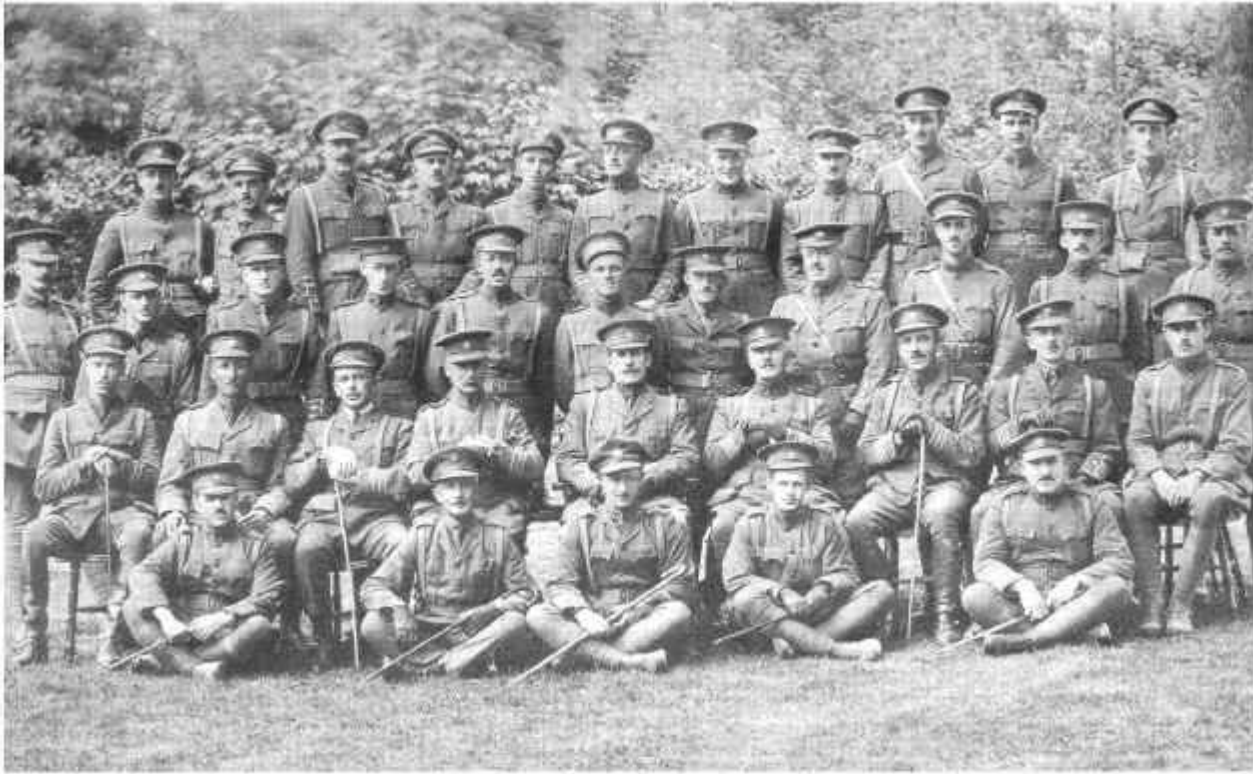
vital to the maintenance of the offensive, and without it, the best either side could hope for was to consolidate their present gains.

Most trenches on the western front were based on a similar concept or pattern. Trenches were constructed four to six feet in width and approximately six to eight feet deep. Every trench was supposed to have a fire step and parapet so that the infantry could fire at the enemy and be able to take cover if necessary. Trenches were also dug in a zigzag pattern so that if the trench was overrun the infiltrators could not fire their weapons down the length of the trench and hit everyone at once. Trenches were normally connected to other parts of the line and to the rear by smaller communication trenches, normally anywhere from three to five feet wide. Most trench systems had some form of reveting and cover, as well as traverses and sandbagged tops and sidings. German trench systems were often much better constructed and more complex than allied lines, containing many interesting features such as deep elaborate dugouts, bomb stores, and well-camouflaged sniping posts. These deadly structures became the priority targets of Canadian raiders and for good reason. A single machine gun nest, well sited and manned by an efficient gunner, could easily halt the advance of an entire battalion.

Beyond *the* trenches lay wire entanglements of every and any shape, strewn out across the entire western front, and often without any tactical considerations beyond local needs. Wire was placed on top of wire where it had been damaged, cut, or destroyed. Soon a sea of entanglement had been created on both sides of no-man's-land. At first entanglements were situated only a few meters beyond the firing step, but they were moved out from the trenches to push enemy bombers from throwing range. Often laid in successive belts and constantly checked by working parties, wire was very helpful in countering infiltration of any kind.

## The Calonne Raid

**B**ully Grenay, a town northwest of Lens, had become the reserve and training area for the 4th Canadian Infantry Brigade (2nd Canadian Division) in the winter of 1916. Engineers of the 4th Field Company under command of Major H.



courtesy Prince of Wales' Own Regimental Museum

*Officers of the 21st (Eastern Ontario) Battalion, CEF, at Bully Grenay, 1917*

St. A. Smith had been tasked to begin work there on a full-scale model of the German trench system in the Calonne area.<sup>6</sup> Brigade headquarters (HQ) had planned to conduct a large scale raid on the German trenches just north-east of Calonne for the middle of January, requiring men from the 20th (Central Ontario) and 21st (Eastern Ontario) Battalions, as well as engineers from the 4th (Montreal) Field Company and other support troops. The 20th Battalion had arrived at Bully Grenay on 28 December, relieving the 18th (Western Ontario) Battalion which was then in the front lines.<sup>7</sup> The 21st Battalion arrived a few days later, and training for the raid began almost immediately. Their operation order later stated, "The 21st Battalion attacking party will enter the enemy trench... for the purpose of inflicting casualties, making prisoners, securing booty and wrecking dugouts in the system of trenches in the area attacked."<sup>8</sup>

The raid was to employ some 860 specially trained troops in total, formed into five operational companies.<sup>9</sup> Commanding the two companies of the 20th Battalion were Major C.C. Wansbrough with No.1 Company, and Major

H.W.A. Foster, MC with No.2 Company (he was also overall commander of the raid). Each company consisted of four platoons, and two sappers from the 4th Field Company accompanied each platoon.<sup>10</sup> The three companies from the 21st Battalion were led by Major George S. Bowerbank (officer commanding the 21st Battalion element), Captain P. Brocklebank, and Major F.D. Raymond. An accountant from the Sarnia branch of the Canadian Bank of Commerce, George Bowerbank had been with the battalion for almost three years, and was a very experienced officer.<sup>11</sup> He had already been mentioned-in-despatches for displaying gallantry and devotion to duty on more than one occasion. Both Major Raymond and Captain Brocklebank had seen extensive service at the front as well, proving themselves to be capable officers. Under these leaders the soldiers of the force were able to maximize success against the Germans.<sup>12</sup>

Men chosen for the raid spent a period of time out on aggressive patrols into no-man's-land to familiarize themselves with the terrain. This had become standard practice, so that the soldiers had less chance of becoming lost while

on the actual raid. It was also a way of 'climatizing' the raiding troops with the environment in which they were going to conduct the operation. This helped to build the confidence of the individual soldier because he knew where he was going and what he was supposed to do and was better able to carry on should his superiors become casualties. Patrolling was complimented by training sessions on models constructed by the engineers. On the morning of 5 January 1917, the sappers along with the infantry went through the dummy German trenches on a practice run under the supervision of the Corps Commander.<sup>13</sup> Lieutenant-General Julian Byng was satisfied that the men were being properly trained and looked towards the operation with confidence in its success.

On 27 December 1916 the enemy wire was completely scouted, and the procedure of systematically destroying it began using medium trench mortars and stokes guns. The Left Group, 2nd Canadian Divisional Artillery, undertook this task. Enemy entanglements had consisted of five or six rows of angle iron knife rests closely laced together, and it was hoped that the artillery would satisfactorily destroy the wire prior to the raid.<sup>14</sup> If not, members of the first wave in the storming platoons had been outfitted with wire-cutting attachments for their rifles. Lessons learned from



the Douve River raid the previous November indicated the importance of conducting reconnaissance prior to an attack. Too often raiding troops discovered rows of barbed wire that was supposedly destroyed prior to the assault lying directly in their path of advance. The ensuing fiasco always proved to be murderous to the attackers. Therefore to confirm the damage to German wire reconnaissance patrols and scouts were sent out to make inspections the evening prior to the raid, and on returning reported the artillery had done its job.

For the raid, each platoon was organized as a separate storming party, with riflemen, bombers, carriers, wire-cutters, stretcher-bearers, and in the case of the second wave, Lewis gunners. In addition to this, two engineers accompanied each platoon, carrying mobile charges and gun-cotton for wrecking dugouts and emplacements. One section of battalion bombers was attached to the two platoons on the extreme left flank, for the purpose of holding the important block on the left in the enemy front line. Six men in each company carried ten No.23 rifle grenades. Every company also had four rolls of wire and canvas slats, to throw over the enemy wire if it was necessary. Only the bare essentials were to be carried by soldiers during an attack, but the sappers on the raid found their loads to be quite cumbersome.<sup>15</sup> In addition to a rifle, bayonet, one hundred rounds of ammunition, and ten bombs, the sappers were also carrying with them ten light ladders, each eight feet long, to be used for bridging trenches or if necessary as stretchers. Also on the kit list were Stokes' bombs adapted for bombing dugouts and a number of 'P' bombs (smoke).<sup>16</sup> All the raiders stripped down their webbing, carrying only their bayonets, water bottles, and haversacks. Men wore the P.H. gas helmet instead of carrying the more cumbersome box respirator.

Such firepower and combat support was needed, for the opposition had greatly improved its strength. In 1914 a German *Landwehr* infantry regiment had 12 companies of riflemen and one machine gun company (six machine guns), and no other supporting units. By 1917, the number of machine gun companies had tripled, lowering the ratio of rifles to machine

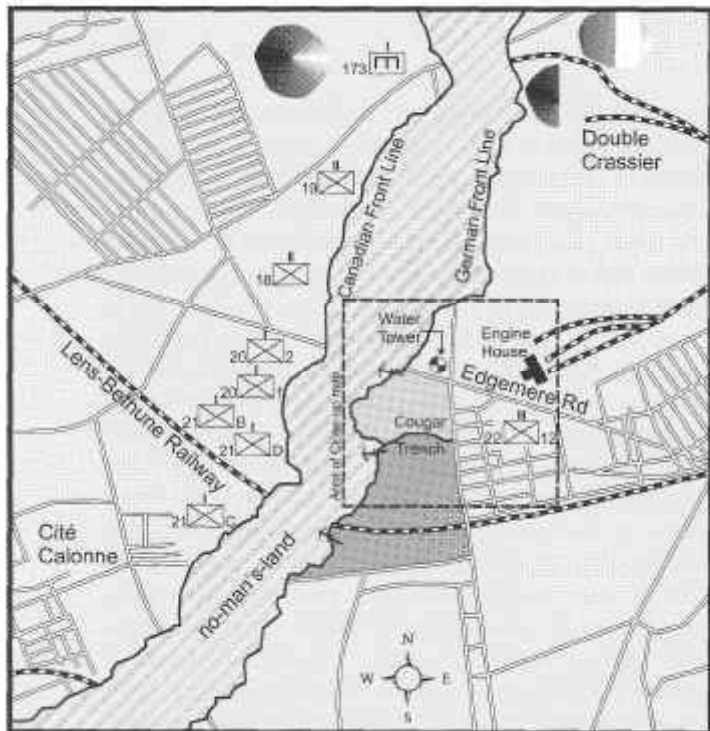
*21st Battalion soldiers practice communications.*

gun companies in German units from 1:12 to 1:4. In many cases German regiments could also obtain additional defensive support around key terrain in the form of machine gun sharpshooter detachments, further lowering the ratio in a given part of the line to 1:2.<sup>17</sup> There was also an increased number of trench mortars, so that by 1917, the Germans could form a platoon of two light trench mortars in each infantry battalion (4 companies). In terms of command in a defensive battle, the German infantry battalion commander had under his control four infantry companies, a machine gun company plus potentially machine gun sharpshooter detachments, and a light trench mortar platoon.<sup>18</sup> Additionally, he could call on fire support from artillery units supporting his part of the line. Nor were his troops an easy target. Instead of standing shoulder to shoulder in trenches as the Germans did in 1914, they were now spaced apart and mutually supporting each other through overlapping arcs of fire. Instead of fighting over every inch of ground, in the defence the Germans secured key terrain, allowed attacking troops to break through loosely-held front line defences, and then engaging them in the flank with machine guns and field artillery. Followed up by a quick counterattack, any breakthroughs were simply annihilated. The Germans believed with these tactics they could effectively repel any attack. The Canadians were to prove them wrong.

Canadian planning for the raid had been thorough. Consistent observation of the German lines had revealed many of their machinegun emplacements, trench mortars, and dugouts.<sup>19</sup> These were the prime targets. The Canadians had become well aware of the German defence-in-depth tactics. Instead of attempting useless frontal assaults and sustaining high casualties, the Canadians had learned to unravel the German defensive web by breaking it apart one piece at a time. Positions were either destroyed by artillery or isolated from their neighbours and taken out by infantry supported by engineers wielding satchel charges. As each position was taken the German mutual support weakened, and eventually the whole defence melted away leaving a gap through which troops could manoeuvre. Canadian infantry also had learned to screen their own flanks with machine gunners supported by artillery. This allowed for increased manoeuvre on an otherwise impassable battlefield.




In the pre-dawn hours of the 17 January the raiders moved into their positions. A hot meal was served to all ranks at 0400 hours and 30 minutes later the troops left Bully Grenay to take up their positions in the front line. The second wave of troops moved into the bays of the communications trench leading into the front line, and those in the third wave occupied the close support trench. About 0715 hours all troops reported they were in position.<sup>20</sup> Conditions were quiet and the enemy had just called their "stand down." It was routine for both the British and the Germans to be at the ready during the dawn of each day, as many attacks took place at that time. Seeing no immediate threat, the detached German posts and sentries began to go about their daily rituals when suddenly at 0745 hours the sky opened up and shells poured into the Germans mercilessly.<sup>21</sup> Parties of the 18th and 19th Battalions carried out diversions on the left flank of the 20th battalion as the assault went in. The confused Germans were slow to react and could not locate where the real attack was coming from. A barrage of smoke was laid in front of the assaulting troops, and favourable wind conditions gave great assistance in covering their advance. At zero hour plus 15 minutes the 173rd Tunneling Company, Royal Engineers, exploded a mine near *Double Crassier*, an important tactical feature well north of the actual attack. This effectively drew attention from the real assault as the Germans, thinking that the diversion by the 18th and 19th Battalions was to be against this point, concentrated their artillery fire there.<sup>22</sup>

Troops of the first wave, covered in snow, poured out of their front line trench with lightning speed and went forward through ten lanes that had been cut in their own wire. Surging across no-man's-land with great accuracy they reached the German wire in less than five minutes, while the artillery was still pounding the German front line with smoke and shrapnel.<sup>23</sup> Weeks of patrolling and getting to know the ground immediately paid off as the raiders reached their entry points with ease. Some recently laid barbed wire did little to slow up the 20th Battalion which quickly cut through the obstacle with their rifle wire cutters. Despite the intense shelling, some of the enemy was still able to man their machine guns, spitting rounds into the Canadian onslaught. However, the German fire was ineffective and the front line opposition was



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-  20th Battalion area of operations
-  21st Battalion area of operations
-  Machine Gun

with a few more prisoners being taken in two of the frontline dugouts. Once the Canadians had secured the front line the officers shot off white Verry lights, signalling that the first objective had been taken.

By 0758 hours, less than 15 minutes after the raid began, Major Raymond was sending back verbal reports using a land line signals phone from the German front line trenches. When his company entered the enemy lines it split into two parties, one deploying on each side of the smashed Lens-Bethune railway line. Lewis gunners set themselves up on the hump, ready to cut down any enemy reinforcements attempting to reach the cut-off Germans. With shell fire was still landing in the enemy front line at this point, Raymond established a temporary HQ and prepared to penetrate 200 yards to "Coyote" trench which ran roughly north-south in front of Cite St. Pierre. As he passed information back to his own Battalion HQ a Lewis gun crew set up nearby was badly mauled by a direct shell burst, wounding three and completely smashing the gun.<sup>24</sup> Major Raymond escaped unharmed and continued to direct his men in the attack. The wounded Canadians were immediately evacuated back to friendly lines using the newly taken German prisoners to help accomplish the task.<sup>25</sup> Despite this incident, however, the friendly artillery fire during the raid was very accurate thanks to excellent communications from Raymond's HQ. The 2nd Canadian Divisional Artillery had sent a forward observation officer (FOO) and a signal man along with Major Raymond to adjust friendly fire as required, making for tight coverage on the objective.

quickly overrun. The 20th Battalion's No.2 Company entered the German front line trenches on the left flank where Edgemere Road intersected with the German front line. Major Foster and his men met little resistance as the artillery had done its job of silencing the defenders. The first line trench was very wide at the top but had collapsed in many places from the shelling. The bottom was covered in water and almost all the dugouts had been abandoned. The engineers noticed that there were few fire steps and very little sign of any recent repairs. To the right Major Wansbrough's No. 1 Company had also secured its portion of the German front line. It too, met little resistance, and Wansbrough's men held their position for a minute or two while teams from the 4th Canadian Trench Mortar Battery softened up enemy targets to their front.

Meanwhile the 21st Battalion raiders were meeting similar success. Men from "B" Company forced their way into Cougar and Cow trenches, while Captain Brocklebank and "D" Company secured the line south of Cougar to the Lens-Bethune railway. "C" Company under command of Major Raymond moved forward south of the railway getting into the German trenches ahead of Brocklebank by about a minute. In all five sentry groups were quickly killed or captured,

The first wave mopped up the front line trenches and secured the flanks while the second and third waves passed over them to assault the second and third objectives in the German rear. No. 2, 4, 6, and 8 platoons of the 20th Battalion went racing up "Cowboy," "Cougar," and "Cooling" trenches, clearing out the enemy as they went. Meanwhile the second and third wave of the 21st Battalion made their way forward to the final objective, "Coyote" trench. The sappers followed close behind, destroying dugouts, emplacements, and bomb stores. Enemy troops were quickly

routed as the Canadians advanced. Some of the trapped Germans scrambled up over the parapets and attempted to escape overland in hopes of putting some distance between themselves and the Canadians. However, such moves were anticipated and the Canadians were ready for them. A Lewis gun team had set itself up at the junction of the German front line trench and "Cowboy" communication trench, and cut down the enemy as they fled without protection. Few, if any, of the Germans made it out alive.

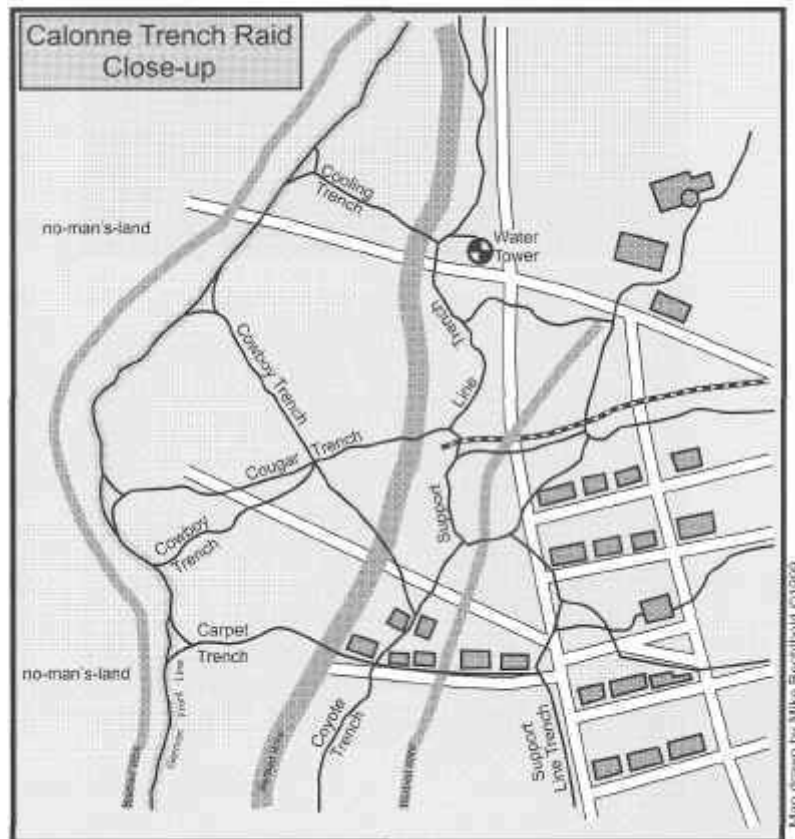
Soldiers from the 20th Battalion got into the German support line so quickly that the Canadian artillery was still busy pounding it when they arrived. Finally the raiders entered it at Z hour plus 24 minutes when the barrage lifted to form its protective half-circle around the entire raid target area. In the German support line the dugouts were more numerous, but the sappers quickly destroyed every one. The infantry were hoping to take more prisoners but the occupants of the dugouts were extremely unwilling to leave their place of hiding and time did not allow for much persuasion. If the Germans did not give up their dugouts immediately they were bypassed and left for the engineers, who threw in mobile charges and annihilated the men and dugouts all together. When a member of the 20th Battalion asked one sapper how he was faring the reply was, "Fine!" He then added, "You come to a dugout - light the fuse - drop the charge in and run like hell - look over your shoulder and see the dugout come out the door!"<sup>26</sup> In all the sappers demolished 35 deep dugouts and two bomb stores.

Some of the German infantry did surrender when coerced by the raiders. When Private Joseph Landry of the 21st Battalion shouted down into one dugout in French, half a dozen German soldiers piled out waving their hands in the air. "Upon seeing me they rushed toward me and clustered around" remembered Sergeant Peter Pirie, who had to stop Landry from bayoneting the German soldiers who he thought were attacking his sergeant. "The Germans had noticed my sergeant stripes and were putting their trust in an NCO."<sup>27</sup> Sergeant Pirie sent the lot to the rear and quickly carried on.

At Z+45 minutes the raiders commenced breaking off their attack. Under the cover of

Lewis gun teams set up to cover the withdrawal, soldiers began moving back towards their own lines. Lieutenant W.M. Goodwin of the engineers exploded an underground camouflet tube from a friendly sap running about 85 feet into no-man's-land, which formed a decent flanking communication trench that the raiders used during their retirement. German artillery also began to increase in severity, but due to confusion on the exact location of the attack, German shells were evenly distributed between the Calonne area, the neighbouring trenches, and the *Double Crassier*. Later a captured German officer reported that when the attack had started he had sent up a *SOS* flare, but was denied assistance because the artillery was more urgently needed at the 'real' attack at the *Double Crassier*. The next thing he knew, Canadian raiders were entering his dugout.<sup>28</sup>

Sections of raiders returned independently to friendly trenches and completed their withdrawal from their own front lines by 0840 hours. Sapper Arnold from 4th Field Company had blown the chains off a German machine gun using mobile charges and assisted in bringing it back as booty.<sup>29</sup> In addition, raiders from the 21st Battalion returned with another machine gun and two trench mortars, as well as 110 prisoners from the German 22nd Reserve Infantry





**Top:** Canadian soldiers bring back German prisoners of war.

**Left:** A German concrete machine gun dugout captured by Canadian troops.

**Above:** Major F. Raymond, MC and bar, 21st (Eastern Ontario) Battalion CEF. He commanded "C" Company, in the Colonne Trench Raid.

Regiment (1st Upper Silesian Infantry Regiment "Keith" of the 12th Reserve Division). Thirty-two more had been counted dead, plus a large unknown number that were killed in their dugouts. The Germans later reported that their losses totalled 18 dead, 51 wounded, and 61 missing. There is obviously some discrepancy, for even if the raiders incorrectly reported the number of Germans killed, they did have over a hundred prisoners in their possession, not 61. Canadian casualties totalled 40 killed, most of which were suffered at the beginning of the assault, and 135 wounded. For example, Major Bowerbank had 21 men wounded, four scouts

wounded, three men missing, and one officer wounded, for a total of 29 casualties (approximately 25 percent of his company strength engaged). However, none of his wounded were serious, and the three missing were later confirmed. Not a single Canadian was left behind in the enemy lines.<sup>30</sup>

Major W.H.A. Foster MC, was awarded the Distinguished Service Order for his outstanding leadership in carrying out the raid. Meanwhile, Major Bowerbank received the Military Cross for his leadership of the 21st Battalion. Sergeant Thomas Galbraith and Private William Crerar of

the 21st Battalion each were awarded the Military Medal, as were Sapper H. Arnold and his teammate, Sapper T. Conely. The latter pair had been responsible for a majority of the damage caused by the sappers against the German defences.

## Military Effectiveness

By definition, military effectiveness is the process by which armed forces convert resources into fighting power.<sup>31</sup> The Canadian Expeditionary Force (CEF) excelled at honing this process. Using its initiative, flexibility, and lessons learned on the battlefield, the CEF was able to develop standard operating procedures that became a role model for the entire British Expeditionary Force (BEF) and its Allies. The military doctrine and operational orders developed by the Canadian staff, based on the extensive experience of its soldiers, was widely circulated throughout the entire BEF and the French Army for instructional purposes.<sup>32</sup> This extensive experience was gained from a continuous series of trench raids and minor operations that were carried out against the German forces on the western front. The trench raid, noted historian Bill Rawling, "was the laboratory" by which the Canadians developed a successful battlefield doctrine. Lessons learned in the field were immediately analyzed and where possible, used to improve doctrine. Doctrine was then quickly disseminated back to the troops through training and staff exercises. The new principles became the tactics that eventually broke the stalemate of trench warfare and brought about a decisive victory against the German Army in the west.<sup>33</sup>

The reasons for conducting raids and small-scale operations were numerous. In addition to those reasons stated above, the raid acted as a "mini-version" of potential larger scale operations. In 1914 the tactics used by the British Army were of little use in the environment of the western front. Technology had put an end to the simple massed assaults of the Victorian age. Small arms had developed to such an extent that some branches of the military (i.e. the Cavalry) were quickly becoming obsolete fighting arms. For example, the machine gun was "cheap, light, requiring few soldiers to man it and firing 450 rounds per minute of relatively lightweight

ammunition which posed no very difficult supply problem".<sup>34</sup> It was an inexpensive investment and in return the weapon sprayed a hail of direct fire-death which put an end to almost every major offensive conducted between 1915 and March 1918. Many armies were literally 'bled white' before alternatives were sought to the brutal frontal assault.

By conducting raiding operations, tactics, equipment, and techniques could be tested without fear of large troop losses. The Canadians suggested that if techniques could be effectively developed to survive and win at trench warfare, these could then be developed further on a large scale to break the German lines and force a decision in the war. The raid had other uses as well. It was an effective way of testing the enemy defences and measuring (and therefore also lowering) the morale of the enemy. Prisoners were taken, enemy units were identified and enemy strengths were estimated. The capture of documents and equipment were important for intelligence purposes. During the Douve River raid in November 1915 Canadian raiders secured "a prize to Canadian Intelligence Officers" in that the German prisoners they took were all sporting a newly developed rubberized gas-mask.<sup>35</sup> Installations were destroyed, especially dugouts, saps and mines, and in general havoc was caused in that particular part of the enemy line. Raiding also induced the enemy to send forward his reserves, which enabled friendly artillery to shell them and cause further casualties. Raiding gave the artillery sufficient chances to practice and improve its own techniques in registering targets and counter-battery fire. In the latter Canadian gunners became experts, which served as an extremely valuable asset in operations in 1918.

Doctrine and tactics evolved considerably due to the knowledge and experience gained from raiding the German lines. Raids had taken on a new purpose. At first designed to simply harass the enemy and cause some damage, by 1917 raids were being used as 'on the job training' for new troops while honing the skills of veteran soldiers. Raids had also grown in size, from a few dozen men of a single infantry battalion to almost a thousand troops from all arms. Combined arms warfare was solidified in Canadian doctrine, and had become the example for all other armies to follow. Later on the implementation of successful unit-level tactics

enabled the Canadian Corps to take Vimy Ridge, the muddy flats of Passchendaele in 1917, and to break the German lines of defence in 1918. All this reflected well on the Canadian Corps commander, Lieutenant General Sir Arthur Currie, who had always encouraged his officers to think and use their initiative.

### Notes

1. *Canada and the Great World War*. Vol. II, pp. 1188-89.
2. Daniel G. Dancocks, *Spearhead to Victory* (Edmonton, 1987), p. 21.
3. G.W.L. Nicholson, *The Canadian Expeditionary Force 1914-1919* (Ottawa 1962), p.122.
4. At the beginning of the war the Princess Patricia's Canadian Light Infantry (PPCLI) formed part of the British 27th Infantry Division. The unit was privately raised and equipped by Mr. Hamilton Gault, a wealthy Montreal business man who gave \$ 100,000 to organize the unit. The PPCLI was originally composed solely of veterans and frontiersmen, and would be considered one of the fiercest of all Canadian regiments in battle. Three members of the regiment were awarded the Victoria Cross during World War I, and the unit still lives today as one of three Canadian regular forces units.
5. A.J. Kerry & W.A. McDill, *The History of the Corps of Royal Canadian Engineers*. Vol. 1 1749-1939. (Ottawa, 1962), p.127.
6. 4th Field Company War Diary, National Archives of Canada [NAC] RG9 III D 3, Vol. 4995. 16 October 1916.
7. D.J. Corrigan, *The History of the Twentieth Battalion (Central Ontario Regiment) CEF* (Toronto, 1935), p.99.
8. NAC RG9 III D3, Vol.4930. 21st Battalion Operation Order No.73, 16 January 1917.
9. Nicholson, p.233.
10. Corrigan, p.99.
11. *Letters from the Front*. Volume I (Toronto, 1920), pp.47-48.
12. Both Raymond and Bowerbank were awarded the Military Cross for their role in the Calonne Raid. See *Letters From the Front*. Volume I. pp.47-48.
13. Corrigan, p. 100.
14. *Ibid.* p. 100.
15. Normally sappers went in with the support waves carrying as much as 120 pounds of gear and stores. It is assumed that for raids they would have travelled more lightly, but this was not to be the case.
16. *Ibid.*, p. 100.
17. B.I. Gudmundsson, *Stormtroop Tactics: Innovation in the German Army, 1914-1918*. (New York, 1989), pp.96-97. See also David Nash. *German Army Handbook April 1918*. (London, 1977). A reprint of the British Army staff handbook of the German Army at War, first published in 1918.
18. *Ibid.*, p.97.
19. NAC RG9 III D3, Vol. 4930, 21st Battalion, CEF, Reference memoranda to accompany operation order No.73, 16 January 1917.
20. Corrigan, p. 102.
21. Nicholson, p.233.
22. NAC RG9 III D3, Vol. 4930. War Diary 20th Battalion, CEF. 17 January 1917.
23. NAC RG9 III D3, Vol. 4930, 21st Battalion, CEF, Reference memoranda to accompany operation order No.73, 16 January 1917. This report contains an appendix attachment of all telephone communications reports that were received during the raid on 17 January.
24. NAC RG9 III D3, Vol. 4930. DHS File 4-30. *Narrative of Raid, 17.1.17*, by G. Bowerbank, OC B Coy, 21st Battalion, p.1.
25. NAC RG9 III D3, Vol. 4930. DHS File 4-30. 21st Battalion, CEF, *Documents belonging to the late Lieutenant Colonel Elmer Jones, Officer Commanding 21st Battalion*. Each company commander submitted a narrative of their respective area of operations to the Lt. Col. Following the raid. Their notes were donated to the Historical Section of the Canadian Army in June 1928 by Mr. A.S. Fraser who was in possession of the notes at the time.
26. Corrigan, p. 103.
27. As quoted from The *Communiqué*, Newsletter of the 21st Battalion CEF.
28. The German officer was a professor from Strasbourg University and spoke good english. See *The Communiqué*, newsletter of the 21st Battalion CEF.
29. The Germans often chained their machine guns down to two-foot pickets within specific arcs of fire. This hindered attempts at turning the weapon around and firing on retreating troops or into the trench should it be overrun by the enemy. The Canadian answer to this was to simply get the sappers to blow the chains off using small amounts of explosives.
30. Nicholson, p.234, and Corrigan, pp. 103-104.
31. A. Millet and W. Murray, *Military Effectiveness Volume One: The First World War* (Boston, 1990), pp.2-3.
32. Dancocks, p.22.
33. Bill Rawling, *Surviving Trench Warfare: Technology and the Canadian Corps, 1914-1918* (Toronto, 1992), p.47.
34. John Swettenham, *To Seize the Victory: The Canadian Corps in World War I* (Toronto 1965), p.92.
35. Nicholson, p. 124.

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