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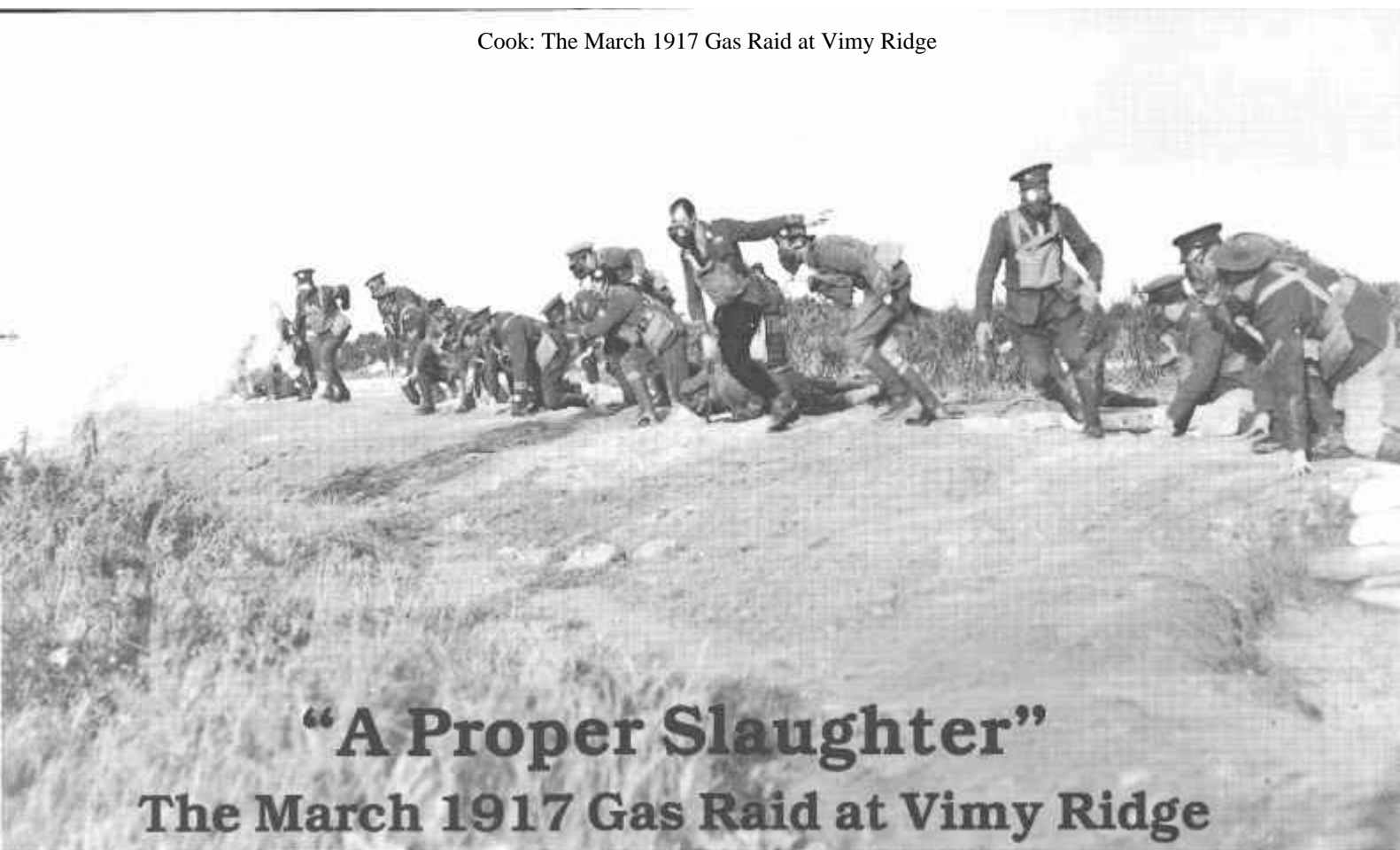
“A Proper Slaughter”: The March 1917 Gas Raid at Vimy Ridge

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“A Proper Slaughter”

The March 1917 Gas Raid at Vimy Ridge

NAC PA 4897

Tim Cook

Sixty thousand Canadians were killed by shell, bullet and poison gas, among other horrors in the Great War from 1915-1918. By the Armistice, roughly one in every nine Canadians who served in France had been killed. The terrible carnage of the First World War remains associated with the major battles which have become the pegs by which the conflict is measured: the 2nd Battle of Ypres in 1915; St. Eloi, Mount Sorrel and the Somme in 1916; Vimy Ridge, Hill 70 and Passchendaele in 1917; and finally, the March offensive and the string of operations making up the Last 100 Days in 1918. But between these great conflagrations, which lasted between three days and three months, there raged hundreds of tiny engagements. For instance, of the 62,315 Canadian casualties in 1917, a full one-third of them came from the wastage associated with the on-going trench warfare, as opposed to the major delineated battles of Vimy Ridge, Hill 70, and Passchendaele.¹ Of those 20,000 casualties, a good portion of them were suffered by soldiers stumbling their way through the trials of trench

warfare until they were blasted out of existence by shells they could not see or fight back against. Yet to helplessly cower in their holes and be bombed day in and day out was both physically and mentally destructive. As a result, the trench soldiers and their commanders adapted to their circumstance and fought back by trench raiding, an activity which allowed soldiers to strike against the enemy and thereby ease the psychological burden of stewing in a trench waiting for the shell with their name on it. Putting oneself in harm's way in order to alleviate the strain of war may seem a strange contradiction, but such raiding helped the soldier cope with his absurd predicament.

The writing of Canadian First World War military history has been largely whiggish in nature: a success story where Canadian lads, after a few hard knocks, repeatedly beat back the Germans at their own game. Charles Stacey, the doyen of Canadian military history, even

Top: Canadian troops train with gas masks.

remarked that the creation of the Canadian Corps was the greatest thing that Canada has ever done.² Heady words, indeed. Accordingly, the corps' successes have generally been emphasized over its failures. And inseparable from those victories was the positive contributions of the Canadian generals. In contrast, British commanders have generally been condemned for their perceived costly and sacrificial failures. Incompetence, rigidity, and a failure to adapt to the new realities of warfare have led a school of historians to remark that the British troops were "lions led by donkeys."³



NAC PA 2116

Some Canadian divisional commanders like Archibald Macdonell, Henry Burstall, L.J. Lipsett, and Raymond Brutinel⁴ were indeed sharper and better able to understand and react to the static nature of the fighting than most of their British counterparts. It should be remembered, however, that Canadian commanders were not initially without their faults, and throughout the war there was a progressive learning experience. In the process there were those who did not measure up to the task of a battlefield command, such as Richard Turner, commander of the 1st Brigade and then 2nd Division, who won a Victoria Cross during the Boer War and whose bravery was never called into question even when his competence was.³ Despite the mixture of generals, the Canadian Corps was gifted with

two exceptional corps commanders, Julian Byng (May 1916 to June 1917) and Arthur Currie (June 1917 to the end of the war).⁶ Behind the easily identifiable commanders stand their subordinates, the dedicated, professional staff officers. All Canadian generals relied heavily on these trained officers, who effectively analyzed, coordinated, and planned operations. And for most of the war, almost all of the senior staff positions were filled by very competent British regular officers. The success of the Canadian Corps in the First World War in large measure should be attributed to this crucial British support. Yet, it is still worth examining Canadian commanders and policies, rather than simply declaring them a breed apart from their British colleagues. Mistakes were made and the history of the Canadian Corps was not one of sweeping successes; it was, rather, one of learning from mistakes and making sure they did not happen again.⁷ This article will probe one such incident: the March 1917 gas raid on Vimy Ridge. This study will not only illuminate one aspect of the history of the Canadian Corps, but will also offer more general observations on the concept of raiding and the nature of gas warfare.

Left: Major-General David Watson, commander of 4th Canadian Division.

Below: Colonel Edmund Ironside, GSO 1, 4th Canadian Division, with his dog Gibby.



NAC PA 1352

The Canadian Corps' youngest and final division, the 4th, arrived in France in August, 1916. Commanded by David Watson, a newspaper editor prior to the war, who had worked his way up from command of the 2nd Battalion, and then the 5th Brigade, until he was finally given his division. Holding down the most important staff officer position (GSO 1) was Edmund Ironside, the man who was in charge of planning operations. Imposing at six foot four inches, he spoke seven languages and was "supremely self-confident, forceful and opinionated."⁸ Nicknamed "Tiny," he brought years of experience to the young division for its first trial by fire. Under Watson and Ironside, the 4th Division acquitted itself well during the bloody fighting on the Somme in November 1916. After the first three Canadian divisions were rotated out of that sector after severe attritional grinding, the 4th Division captured Regina Trench. Notwithstanding that the once formidable Regina Trench, with its bristling barbed wire barriers, fortified trenches and interlocking machine gun nests, had been blasted out of existence by the Canadian artillery, the soldiers of the 4th Division showed that they could fight alongside their more experienced countrymen, and with 4,311 casualties, die like Canadians too.⁹

Following the fierce fighting on the Somme the 4th Division joined the Canadian Corps on a quieter front. Not content to sit back, the Canadians actively raided the German lines, causing casualties and eroding the German morale. Taking pride in winning control of no-man's-land, the Canadians began to not only compete among themselves but with other units for the biggest bag of prisoners or the most destruction wrought.¹⁰ The policy of raiding began to spiral out of control and the 4th Division was not immune to the informal rivalry. In fact to distinguish itself, the 4th Division planned the largest Canadian raid of the war, a 1,600-man attack behind a poison gas cloud against the heights of Vimy Ridge. Actually, it was to be more of a clean up and reconnaissance, for the raiders were told that the gas would wipe out the enemy and their role would centre on destroying a few dugouts and gathering information from the dead. The result was very different and the subsequent butchery nearly crippled the 4th Division as an effective fighting formation before its major assault on Vimy Ridge.

This article will offer a case study to understand better the Canadian policy of raiding; piece together the fragmented narrative of the raid itself, which has previously been examined without a proper understanding of the integral component of poison gas; and attempt to analyze why the raid was such a failure. Unrealistic expectations, a break-down in command, an absence of doctrine, and most importantly, the inability of staff officers to understand and adequately employ poison gas, culminated in the most self-destructive Canadian raid of the war. The interplay of technology and soldiers is a tenuous subject, but it is the key to understanding the failure of the Gas Raid of 1 March 1917.

After losing 24,000 casualties in the grisly fighting on the Somme, the Canadian Corps under the command of Sir Julian Byng turned in the winter of 1916-1917 to rebuilding its shattered battalions and integrating new troops into the formations. Despite their losses, and during this period of recuperation, the Canadians continued to harass the German lines by trench raids. Long had the Canadians been regarded by the British as elite soldiers and their refinement of trench raiding in the last month of 1915 had led Sir Douglas Haig, commander-in-chief of the British Expeditionary Force, to congratulate the colonials for their skill and elan.¹¹

The Canadians transformed trench raiding to a deadly art, which wore away at the enemy's morale and strength as he was kept taut and nervous whenever opposite the "wild colonials."¹² The raids were conducted in the dead of night and centred on the principle of destroy and retreat. They were not meant for holding ground in the enemy trench, simply to wreak havoc. The chaos of night fighting, false attacks and barrages up and down the enemy front line, disrupted communications, and the inherent confusion of ascertaining where the exact attack was being launched, left the defenders momentarily vulnerable. Yet trench raiding was not without its costs and the intricate plans could degenerate into mad, vicious battles with high casualties to both sides. Casualties notwithstanding, the success of the Canadians in winning control of no-man's-land, as well as recognition in the language of the trenches as "fire-eaters,"

further pressed their commanders to organize larger more innovative assaults.

After a series of daring raids, the 4th Division planned a larger and riskier operation than anything carried out by its more experienced corps companions. It was to be launched against the heights of Vimy Ridge, a position which dominated Canadian lines and included the unmarked graves of thousands of Frenchmen from two previous failed but more formal assaults. As a result of the particularly strong position held by the Germans on top of the ridge, the planners decided that poison gas would be employed to suffocate the dug-in garrison. Components of four battalions would raid the enemy lines. This policy of raiding was not born in a vacuum, however, and there was a gradual evolution culminating in the massive chemical raid.

The solidifying of the Western Front and the resulting trench warfare had rendered soldiers unable to strike back at their tormentors, the enemy artillery. No sweeping flank attacks or daring bayonet charges were possible, and the infantryman was forced to eek out an existence as he held his fortified ditch against possible enemy attacks. While statically defending the front, the soldiers made excellent targets and there was continuous wastage - everything from snipers picking off exposed sentries, stray shells caving in dugouts or gas discharges burning out men's lungs. The same was occurring on the other side of no-man's-land, and it was this policy of attrition which Sir Douglas Haig regarded as useful in grinding down the enemy's forces. The soldiers were not always happy to comply and the necessary attrition threatened to dwindle away in some of the quiet sectors where the infantry were not willing to "waste" themselves against the enemy.

In those areas loomed the hard reality, at least to Haig, of the phrase: "live and let live." Opposing units, often within a hundred yards of each other, could choose not to bomb, shoot and otherwise actively seek out the death of the enemy if he chose in turn to do the same. It was based on a series of implied codes which each side worked out by a system of retribution and reward. For instance, if one battalion bombed heavily, the other called down a massive barrage on their lines; leave us alone, and we'll instruct the

bombardments to fall behind your trenches. This arrangement of complicated truces was of course not conducive to winning the war; one historian has remarked that close to one-third of the British units attempted to set up this "live and let live" system when they went into the lines.¹³ The main deterrent was an enemy who refused to follow the rules. The Canadians were known to do just that, and in the four months prior to the formal Battle of Vimy Ridge in April 1917 they launched at least 55 raids.¹⁴ With an already established elite reputation, the Canadians were generally not interested in playing games so they might stay forever in the rat-infested ditches they called trenches.¹⁵

The most likely victims for the raiders were the unfortunate sentries who kept watch in the listening posts in front of the enemy lines. An unenviable posting at the best of times, the listeners had to contend with their own fears, the surreal landscape of no-man's-land at night, and, most of all, the fact that there were trained killers lurking amongst the bodies and shellholes ready to snatch or dispatch them. For Battalion or Brigade commanders, the aim of the raids was to hit back at the enemy, keep him apprehensive, exert control over no-man's-land, gather information on what units were opposite, look for any new fortifications or gas canister emplacements, and of course, kill the enemy. Higher commands viewed raiding as keeping the soldiers active and battle-hardened as well as, among other things, destroying the live and let live system. There could be no informal truces where soldiers were actively hunting each other in no-man's-land; few men would sleep soundly at the front.

The wearing-down process was partly accomplished through harassment by poison gas. By 1917, the Canadians had been subjected to several gas cloud attacks from the Germans. The most famous and lethal was the second chlorine gas attack of the war on 24 April 1915 during the 2nd Battle of Ypres. The Germans had unleashed their new weapon two days earlier against two French colonial and territorial divisions to the north of the Canadian line and had completely routed them, leaving a mile long gap which the German infantry flowed into. The raw and untried men of the 1st

Canadian Division shifted over to block the enemy, all the while launching desperate counterattacks. The casualties were appalling but the Canadians held the line as the British rushed up units piece-meal.

When the Canadians were gassed on the 24th, some of the more astute officers, non-commissioned officers and privates, noticing the green tarnish to their buttons and bayonets from the earlier gassing, as well as the smell and affect on their eyes and lungs, had surmised that the Germans had employed chlorine gas. As the green-yellow death cloud floated through the Canadian lines, men passed on hurried advice to "piss on a rag and stuff it in your mouth if you want to live."¹⁶ The urine reacted with the gas and generally protected the lungs. Those in the path of the cloud who covered their mouths with the foul rags generally survived the gassing; those that could not or would not, died or were severely disabled.

The relentless pressure of the German onslaught pushed the Canadians back, forcing them to leave many of their wounded and almost all of their dead to the Germans. The afflicted men turned green and then black as they struggled to breath through their destroyed lungs. In addition to the physical effects, the gas attacks disrupted communications and induced chaos in the command structure. To many Canadians it was simply murder as chemical agents relentlessly swept across their positions, suffocating and killing men at random. It is difficult to put an exact figure on the number of gas casualties, but in addition to those many who suffocated outright and were left behind, more were killed by conventional weapons as gassed men flopped helplessly about, forsaking cover and running to the rear. Rendered senseless, many others were captured. Finally, there was no consistent attempt to count and accurately label those gassed men who made it off the battlefield, only to die in military hospitals. After three days of grim fighting, the 1st Division had lost half its fighting strength - more than 6,000 casualties - but in return, it had made a reputation as an elite fighting force.¹⁷

As the Canadians dragged themselves into reserve, Allied politicians and newspapers universally labeled the German use of gas as barbarous.¹⁸ Soldiers from the lowest private

to the highest field marshal were vehemently opposed to the use of chemicals to suffocate men who had no chance of defending themselves. It was contrary to the rules of war as set out at the Hague Conventions of 1899 and 1907, but more importantly, it was counter to the perceived notion of how war should be fought. War had been envisioned as a great game, where the young men of Europe would come into their own on the battlefield and the decadence of modern society would be purged. Such notions, had, of course, already been blasted out of the soldiers at the front by the more than one million dead at this point in the war, but gas was still seen by many as simply too much. The frantic scramble to devise some form of protection resulted in a series of gas masks that initially offered more psychological than physical protection. All the while, the advanced state of the German chemical plants supplied the army with vast stores of chlorine and later - eight times more lethal - phosgene gas, in the hope of ending the deadlock of the trenches. When the British began to manufacture their own gas in mid-1915, the battlefield was quickly deluged in chemical agents.

The Canadians were gassed several more times with chlorine and, after 19 December 1915, phosgene. More debilitating, they began to fall victim to German gas shells in mid-1916, as opposed to earlier and less reliable and accurate gas released from buried canisters. During the battle of the Somme which raged from July to November 1916, both sides employed gas in greater amounts, more frequently and to accomplish a variety of tactical applications. Counter-battery work, the disruption of the lines of communication and forming up points, and the harassment of soldiers and animals were all accomplished by gas shells. Even with these new roles, there remained, however, a shortage of gas shells in the BEF (the Canadian Corps did not receive their first lethal shells for use until April, 1917)¹⁹ and the gas specialists were forced to continue using canister-released cloud attacks. Having no special attack gas personnel themselves, the Canadians relied on the British Royal Engineers Gas Specialists to release chlorine and phosgene from the metal canisters on their sectors of the front.

The Special Companies were groups of trained Gas Specialists whose job was to gauge



A gas cloud being released from canisters on the Western Front circa 1916.

the wind, make sure all of the hoses were emptying gas in the right direction into no-man's-land, and then release the gas from the canisters at the appropriate moment.²⁰ The Specialists were generally viewed with distrust by the infantry who knew that once the gas was released, they retreated to the rear "before all hell broke loose."²¹ One regimental historian noted that there was always intense retaliation by the enemy artillery for the release of gas, and the infantry were less than pleased with its use on their front; it could also turn back on them in weak or suddenly reversing wind, as happened to the British at Loos on 25 September 1915.²² Yet the British high commands continued to view gas, despite the infantry's apprehension and partly because they did not understand its limited nature, as a useful weapon which could be employed in conjunction with the infantry to achieve surprise tactical success.

After being plagued by more frequent German gas attacks, the Canadian Corps decided to retaliate on 16 January 1917. The 8th Canadian Brigade, 3rd Canadian Division,

proposed to have a gas cloud released in its sector which would be followed by a smoke attack and then a series of raiding parties. The raid was intricately planned and every attempt at realistic training and the coordination of the attacking parties was orchestrated. The Canadians had already learned that the dangers of night raids were numerous, and soldiers who were simply sent over to wreak havoc invariably failed with high casualties. It had to be a planned operation, like a miniature battle. Men were equipped with trench weapons like Mills bombs, revolvers and knives; scouts snuck into no-man's-land to plot hidden routes through the enemy wire; sentries were warned to expect men coming in along their front; and the artillery was instructed to fire box barrages to isolate the defenders. All of this took time and planning, especially for the larger raids involving hundreds of men in company-sized assaults.

The introduction of poison gas to the raid caused some concern among front-line commanders, and complicated the already delicate planning. Time and time again gas delivered from buried metal cylinders had

proven to be unstable. At best it involved days of intense labour in bringing the 150 pound gas-filled canisters to the front, planting them beside terrified infantrymen and waiting for a proper wind; at worst, the canisters could be punctured by enemy shrapnel or, when released, unfavourable winds could turn the gas on the infantry waiting to go over the top. Despite these drawbacks, gas caused genuine fear and confusion in the enemy's ranks.²³

For weeks before the raid, the Canadians organised carrying parties of forty-eight men each to bring the canisters from the rear on toboggans and then dragged the final distance overland during the night to the front-line trenches.²⁴ When the "rats" (as they were code-named) were brought into the lines, men of the Royal Engineers Special Companies set them into specially prepared "rat traps." They were buried halfway into the trench floor, sandbags surrounding them with flexible hoses attached to the nozzles and running into no-man's-land. They appeared innocuous, except of course to those men who had to occupy the trenches, continually praying that the Germans did not unleash an artillery strafe that might crack them open. Even if not burst open, the infantry knew that the use of gas instigated harsh retaliation.

An uncooperative wind remained a problem. From 14 January onward, the weather was moving from east to west, against the Canadian lines. All soldiers were required to keep their small box respirators (gas masks) on their chests, anxiously awaiting any indication that the Germans might pre-empt their gas strike with one of their own. The delay was even more intense for the battle groups, each made up of two officers and 35 other ranks from the 4th and 5th Canadian Mounted Rifles, who were to go over the top following the gas and smoke releases.

The carefully worked out plan called for the Canadian front line to increase its activity by firing machine guns, shooting flares and moving about the trenches to give the impression that they were nervous and anticipating a raid from the Germans. This was to be carried out from sunset to zero hour at 8 pm on 16 January. At zero hour the infantry were to blaze away with their machine guns and throw hand bombs into the gaps in the wire. It was hoped that this would impress upon the confused Germans that the

Canadians believed they were being raided. Amidst this confusion and noise, the field artillery was to lay down a barrage on the enemy trenches and the heavy artillery to bombard the reserve areas, thereby, isolating the Germans in the forward zone who would head into their dugouts to escape the high explosive barrage. As this was happening a strong wind was to carry the simultaneously released poison gas over into the enemy lines to seep into their trenches. The artillery would continue moving back and forth over their position in order to cause more friction among the defenders and would stop only at 65 minutes past zero. At zero plus 120 minutes a smoke wave would be put over by the Special Companies using specially designed smoke-candles and the raiders were to follow into the German lines.²⁵

As the infantry, artillery, special companies and their commanders waited for a proper wind, minute after minute ticked away until the zero hour was missed. The 8th Brigade was scheduled to be pulled out the next morning and relieved by the 26th British Infantry Brigade, but clinging to the hope that the wind would change, the Canadian raiding parties were left in the line. The raiders were withdrawn to the reserve trenches after two days, but they still intended to carry out the operation. For two weeks the raiding parties were moved up the line and then back again as the wind remained temperamental, constantly changing direction or strength and leaving all involved thoroughly disgusted. By 4 February the 8th Brigade was moved to a different sector of the front and the battle groups rejoined their units, having left the gas canisters to the British occupying that sector.²⁶

While the raiders were being sent up and back down the line, on 31 January 1917, the Germans released a 10 kilometre long gas cloud of very dense concentration and long duration against French units between Marquises and Auberive. Despite the fact that the French had received warnings of the impending gas attack and that it was delivered in daylight, they suffered 1,900 casualties, of which more than 500 died.²⁷ The disquietingly high casualties and the shocking lack of French anti-gas discipline was passed on to all Allied armies in the hope that such a disaster would not happen again. Not having received a formal report of the 3rd Division's stillborn raid, and impressed

with the recent German gas results, the 4th Canadian Division resolved to incorporate gas into its forthcoming raid against the heights of Vimy.²⁸

After several months of trench raids gathering in scope and size, the 4th Division planned to launch the largest Canadian raid of the war to date. It was labeled "a reconnaissance in force,"²⁹ and the operation was to consist of 1,700 men from the 54th, 72nd, 73rd, and 75th Battalions. Their objective was the highest point on Vimy Ridge, Hill 145 (where the Vimy Memorial now stands), a fortified series of interlocking machine-gun nests, wire belts and deep dugouts. The danger and complexities of attacking up-hill where the Germans would have the advantages of their fixed defences as well as the heights, when combined with the difficulty of accurately laying down counter-battery fire on the enemy guns, resulted in the plan being conceived as a surprise attack. Because of the strong defensive position, it was necessary that poison gas smother the enemy before he realised what was occurring.

The conception was flawed from the start and the division's staff officers planning the raid had little understanding of how chemical agents worked in battlefield realities. Ever since the British disaster at Loos in 1915, canister-released gas clouds were seen as a fickle weapon, to be used only by specialists who were seen more as chemists than soldiers. There was simply very little understanding of this weapon by senior commanders, who hoped that any release of gas would emulate the first gassing at 2nd Ypres when two whole divisions were routed. Although gas was still a fearful weapon, better anti-gas discipline and respirators ensured that no such rout would occur again.³⁰ Equally detrimental, the staff officers and commanders had neglected training their soldiers in any doctrine - or set of common accepted instructions or guidelines - about how to work with this weapon. Yet, because of the formidable position of the Germans on Vimy, gas was needed for the very reason that other more conventional weapons could not guarantee success. Gas was not the weapon of choice, but of desperation. Ill-placed faith created delusions which outweighed all logical assumptions.

Moreover, the heights of Vimy were ill-suited for a gas cloud release. Being heavier

than air, poison gas sinks into low-lying trenches, dugouts and shellholes. Gas was an useful weapon for ferreting the enemy out into the open, but it had to reach his lines first. For gas to move uphill would require a very strong breeze and without it the gas would pollute the craters and depressions that pocketed the Vimy battlefield - the exact positions that the attackers would have to pass over to reach their destination. Without a forceful breeze the operation would be fiasco.

The 85th Battalion took part in carrying hundreds of gas canisters into the trenches in preparation for the gas attack; its regimental history notes that "fifteen tons of gas was to be sent over to strike terror into the black heart of the enemy. The first wave was to be of deadly poisonous gas that would kill every living thing in its path: while the second would corrode all metal substances and destroy guns of every description. When complete all our men would have to do would be to walk into the enemy trenches, throw out their dead bodies and take possession."³¹ Such assumptions must have sounded fanciful to some of the veterans, but as this was the official line, and it accorded with the constant rumours that percolated at the front with regards to new, lethal gases being introduced, it is little wonder that the "poor bloody infantry" placed so much faith in their gas clearing the enemy trenches.³²

Once again the task of bringing the gas cylinders into the line fell to the infantry and as one Canadian remarked, it was "a stupendous job." I saw "grown, strong men cry, just exhausted."³³ Private Owen Bingham of the 78th Battalion added that those frightful canisters required such an exertion that only about half the men in his battalion were able to carry them.³⁴ Despite the difficulty of the task, the "lunch baskets", as they were code-named this time, had been brought and set-up in the front line by the night of 25-26 February. It was left to the men of Special Gas Company "M" to give the signal when the wind was of the right speed and direction.

Some had a better tactical appreciation of the situation and at least two of the four Battalion commanders argued that the raid was impractical. Lieutenant-Colonel A.H.G. Kemball, the commander of the 54th Battalion, objected to Brigadier-General Victor Odium,



NAC PA 1050



NAC PA 56171

Examples of gas masks. Above, a soldier adjusts his comrade's gas mask; Right: an early style gas helmet.

commander of the 11th Brigade, that because of the unpredictable wind, the raid should be postponed and more artillery fire brought to bear on the German lines. Equally concerned, Lieutenant-Colonel Sam Beckett, the commander of the 75th Battalion, believed that not only was the surprise attack no longer a secret, but that his troops had no training with gas. Aware that two of his experienced and decorated battalion commanders were unhappy with the plan, Odium, long a veteran and accomplished planner of raids himself, questioned his orders by writing to and then strenuously arguing with General Staff Officer 1 (the highest staff position in the division) Lieutenant-Colonel Edmund Ironside. His central concern was that if the gas failed how were his men to get across no-man's-land before the enemy barrage opened up?³⁵ Ironside, a future Chief of the Imperial General Staff, refused to entertain ideas about postponement - too much planning and hope were riding on the raid. Their objections overruled, the attack groups were moved to the front to prepare for the assault. Despite the fact that commanders never accompanied raiders, both Kemball and Beckett refused to send their men into the questionable battle without leading them from

the front. In the end, two experienced battalion commanders, who had scouted the area and seen the formidable defences their men were up against, were ignored by staff officers willing to rely on a super-weapon to overcome defenders who had spent two years fortifying their position.

As the men of the 4th Division lay in the cold mud, nerves taut, waiting in anticipation for the opening barrage to begin, the soldiers of the four attacking battalions cursed the weather, the Germans and probably the Gas Specialists as the wind remained too light or blowing in the wrong direction for a canister gas release. The frustration began to mount as the intricate raid was postponed again and again. Staff officers began to wonder if the surprise of both the raid and the use of gas had been lost; officers and men at the front knew for sure as the German defenders shouted taunts to the Canadians to come over the top.³⁶

In addition to the psychological pressure of repeated postponements, the waiting also

took its toll physically; for example, the 12th Brigade lost three killed and 22 wounded from stray shelling on 26 February alone.³⁷ Moreover, during the delay, at least one German artillery barrage "searching" the Canadian front punctured some of the canisters. A sentry noticed the gas and awoke his platoon, but fearing to alert the Germans he did not raise a gas alarm. Word was quietly passed along the trenches, but it failed to reach a small group of infantrymen in the path of the wayward cloud - all were poisoned and one man suffocated to death.³⁸ The Canadians were learning the hard way that employing infantry and gas together in an attack was a dangerous proposition. Still, the plan remained unchanged and the raiders were to follow behind the second of two gas clouds into the German trenches. It was the second gas cloud which was to seal the German's fate, as it was planned to catch many of them unprepared, exhausted and lethargic from their ordeal with the first cloud less than two hours earlier.

At last the wait ended when the British gas specialists indicated there was proper wind strength on the last night of February 1917.³⁹ At 3 a.m. on 1 March, the Special Companies' Gas Sergeants, wearing red, white and green brassards to indicate to the Canadian infantry who they were, released 1,038 cylinders of White Star (chlorine and phosgene) gas into a stiff breeze of 9 miles per hour, which carried it quickly over to the German lines.⁴⁰ Unfortunately for the Canadians, the German defenders had only recently been issued new orders to combat gas cloud releases: "As soon as the alarm is given shoot up red and green flares. Our artillery will fire into the gas cloud and on the hostile trenches."⁴¹ True to orders, the German counter-barrage fell on the Canadian lines and immediately punctured several canisters holding phosgene for the second wave release, gassing groups of Canadians and gas specialists. It did nothing to raise the infantry's impression of their special weapon.⁴²

Messages sent back to the 4th Division Headquarters by forward observers noted that the Germans, adopting the new gas defence, immediately fired red SOS flares and kept their rifle fire "fairly regular" until the gas had moved past their lines.⁴³ The use of gas had brought the

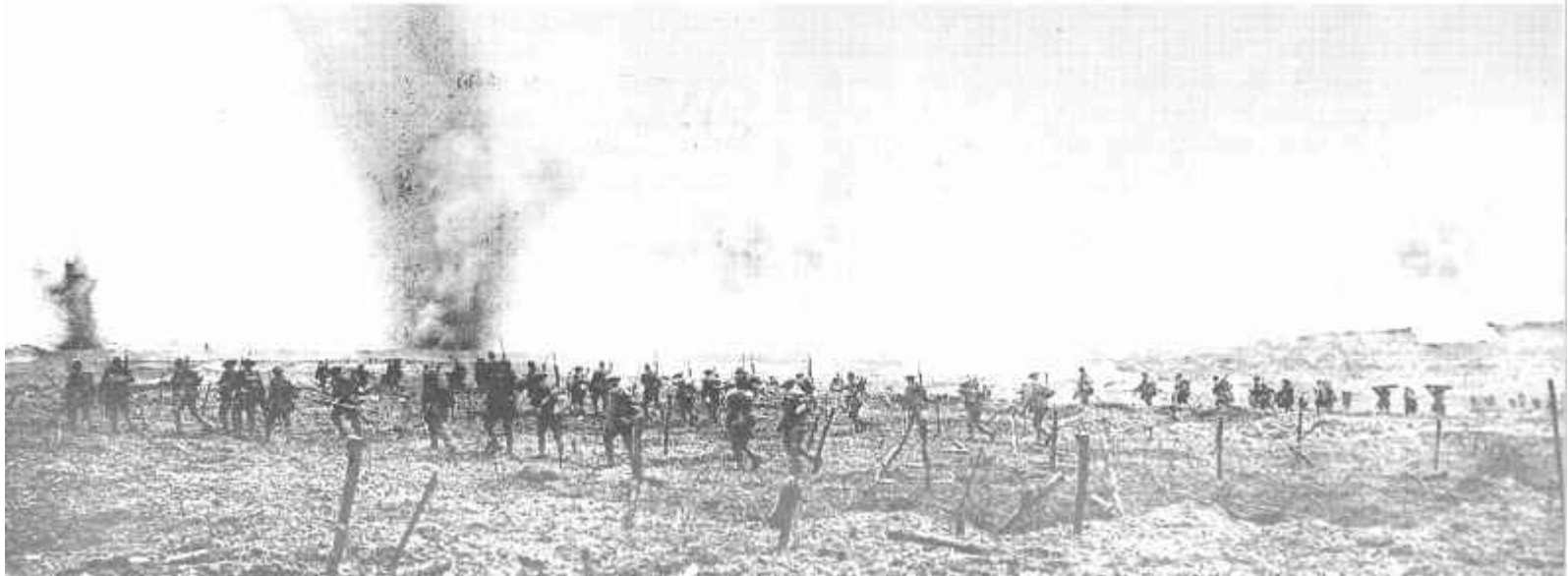
Germans out of their dugouts, and because the artillery fire from Canadian guns was "not sufficiently concentrated and caused no slackening of enemy fire," that is where they remained - in position and manning their fortified trenches.⁴⁴

The raiders were to go into no-man's-land at 0540, forty minutes after a second discharge of gas. But minutes before the second gas cloud was to be released, the wind changed and it could not be liberated. In the 12th Brigade sector, however, the message was not received and, when the gas was released, it slowly moved up the ridge only to stop and begin to float back towards the Canadian lines, eventually drifting through the waiting soldiers of the 11th Brigade on the left.⁴⁵ A private from the 102nd Battalion, Maurice Bracewell, remembered the terror as the gas turned and seeped back into the Canadian lines: "Our front lines got all the gas, the front trenches were saturated with it."⁴⁶ Although the gas casualties suffered by Canadians were not recorded in the confusion, they were probably not heavy considering most men were equipped with the very effective Small Box Respirator. Because the gas was so dense in some areas, the raiding parties, most from the 73rd Battalion, were forced to leave their trenches, suffering additional casualties from shell and bullet, as they proceeded overland until they found their assembly points.⁴⁷

Mistakenly thinking that the second gas attack had blown through the German ranks, one officer of the 50th Battalion, whose unit was acting as a reserve on the flank of the 75th Battalion, believed the orders passed down from higher commands that our comrades "were just going to jump over the top and pick up all these gassed Germans." When he looked across the two hundred and fifty yards of no-man's-land, just minutes before the first wave of 75th Battalion men were to go over, he was shocked to see the Germans tightly packed in their trenches, bayoneted rifles aimed at the Canadian lines.⁴⁸ The Canadian raiders, already committed to battle and spurred on by their earlier raiding success, persevered in the hope that the Germans had been sufficiently overcome by the first wave of gas. They were not.

At zero hour the Canadians went "over the top" and were met by withering fire. The two Battalion Commanders were killed while leading their men in the charge: Kemball of the 54th Battalion was riddled with bullets as he searched for an opening through the German wire, his body caught on the spooled rolls like some macabre scarecrow; Sam Beckett, at the head of his troops as they scrambled across the fire zone, was shot through the heart by a sniper. Because it was expected that the gas

for help, only to watch a bullet shatter his skull and splatter brain and blood over him.⁵¹ Still the Canadians rushed on, advancing through craters and over fallen comrades. Jack Quinnell, like the rest of the Canadians caught within the withering barrage of metal, skirted shellhole after shellhole as he attempted to draw closer to the German line. Popping into a crater already occupied by one of his officers, the man turned to him and shouted, "I'm going to make a run for it; you can do what you like."



Canadians soldiers advancing across no-man's-land.

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would silence the enemy, white flags had been set up to mark the gaps in the wire. These now drew the Canadians into natural killing zones as German machine-gunners aimed at these hard-to-miss targets.⁴⁹ Scores of Canadians were mowed down as they struggled through the wire of no-man's-land. In less than five bloody minutes, the 54th Battalion alone lost its Commanding Officer, two of the four Company Commanders killed (the other two injured) and close to 190 men, remembered Sergeant Major Alex Jack.⁵⁰

The futile assault degenerated into a chanel house, but throughout it the Canadians displayed their reputation for dogged tenacity which they had won on earlier battlefields. It was a grim time nonetheless as friends and companions who had survived the horrors of the Somme were cut down in swaths. Caught on some wire in no-man's-land, Signaller Stanley Baker turned to his partner

He rose and stumbled off, promptly taken down by a bullet. The wild dash across no-man's-land was the last for many Canadians that day as enemy fire, poison gas and even Canadian shells falling short, left bodies strewn over no-man's-land.

The Canadian gas cloud vapours to shellholes in no-man's-land and was strengthened when the Germans fired gas shells into the Canadian assembly trenches forcing the raiders to don their respirators, which reduced visibility and made it more difficult to breath as they desperately sought gaps in the wire.⁵² In spite of all obstacles, a group of Canadians cleared a 500-yard section of the German trench in hand-to-hand fighting. The general breakdown of the assault meant the surviving Canadians from all four battalions were forced into a running battle in the German trenches. Cut off from their own lines by counterattacks, the Canadian infantry

were virtually surrounded until a successful break-out by several officers allowed dozens of men to escape. But, as one trench warrior observed, "we had very heavy casualties, especially among the officers."⁵³

Those soldiers wounded in no-man's-land crawled to shellholes for safety and in the process often fell victim to their own gas which had pooled in the mucky depressions. Stuck in a crater while the Germans sniped anything that moved, Stanley Baker remembered watching the men in his large hole slowly being killed as exposed heads and backs were blasted by sharpshooters. Employing one of the Canadian corpses for cover he used his helmet to dig a shallow trench to reach another hole in the rear. The lingering gases made him cry and vomit, but he finally wormed his way back to the Canadian line later that night.⁵⁴ In the chaos of the battle, with smoke and fire obscuring vision, gas masks clouding up and reducing the intake of breath, many of the soldiers removed their respirators for periods of time. Many were overcome by gas. Those who did not quickly escape their shellholes never left.

Those who were not suffocated by their own gas cried out piteously all night, their voices rising and falling in shrieks and moans, but always carrying over the battlefield. One final tragedy occurred when several wounded men were trapped in a series of shellholes near the Canadian lines by German snipers. An officer called down an artillery barrage on the German positions to give some cover to get the wounded in, but once again the fire was short and many of those men were annihilated by their own shells before the guns were frantically called off.⁵⁵ Although danger remained from snipers and stray shells, several Canadians who could not stand leaving their companions behind slipped over their own parapet to locate victims and drag them into the lines. Dozens of men were later found in gas-infected shellholes covered in yellowish bile as they uncontrollably discharged pints of liquid from their lungs. The gurgling of companions' last breaths through corrupted airways was a memory that haunted many survivors for the rest of their lives.

The ghastly carpet of Canadians that covered much of the battlefield was so disturbing that, on the morning of the 2nd, a

German officer rose above his parapet with a white flag and walked into no-man's-land where he offered the Canadians a respite to collect their wounded and dead. Several Germans also helped to gather a number of the slain which were deposited near the Canadian lines. One of the 43 corpses was Colonel Kemball, who was peeled off the German wire and returned with honours. At a prearranged time the hostilities continued at 0815 hours on 3 March.⁵⁶

When the roll was called the next day, the full extent of the disaster became known; the four attacking battalions suffered 687 casualties - a 43 percent casualty rate.⁶⁷ Those men who were not too numb with exhaustion began to question the whole raid. The War Diary of the 54th critically remarked that the "first discharge of gas apparently had no effect on the enemy," but more importantly, the question arises as to why they would have thought any differently.⁵⁸ Both the Canadians and Germans were equipped with very good gas masks by this point in the war, which made the use of canistered gas almost useless unless employed against poorly trained or surprised opponents.⁵⁹ The distance of 200 to 250 yards between the lines meant that the enemy had between one and two minutes before the gas reached them. That was certainly enough time to don respirators, especially if they were aware of the possible use of gas. The series of delays, when combined with German intelligence gathered from raids and simple observation, had already eliminated the surprise factor. It is clear, however, that both Ironside and Watson were unwilling to call off the long-awaited raid. Gas was a weapon which was supposed to have made the raid a walk-over, and instead its use led to one of the worst disasters of the war for the Canadian Corps. As Stanley Baker of the 54th Battalion bitterly remembered, he knew little of gas before the battle, but by the end he "knew what it tasted like."⁶⁰

If gas was despised by the front-line troops, it was now also universally condemned by the commanders in the rear. In an after-battle report, Brigadier-General J.H. McBrien, commander of the 12th Brigade, noted that the initial "discharge brought the enemy up out of his dugouts and made him suspect and prepare to resist an attack or raid."⁶¹ His equal, the

Brigadier-General Victor Odium (holding rifle), commander of 11th Infantry Brigade.

commander of the 11th Infantry Brigade, Victor Odium, was more emphatic and raged that the infantry should never have been sent over, for it was obvious with the rifle fire coming from the German lines that the defenders had not been incapacitated by the gas.⁶² Their commander, Major-General David Watson, echoed his brigadiers, and later wrote that "gas was overestimated, and too much reliance was therefore placed on it."⁶³ The Canadians had honed their raiding skills during the last two years, but they had no idea how to integrate poison gas into that type of warfare, the exact operation that should have been investigated and studied by Ironside and Watson. Such reflections were correct concerning the limited usefulness of gas clouds as tactical weapons, but that did little for the hundreds of Canadians rotting on the battlefield.

Gas remained a very useful weapon when employed properly, but the infantry hoped to never see the vile stuff again. As the war progressed, so too did the use of poison gas, until by 1918 it daily plagued the soldiers on the battlefields of the Western Front.⁶⁴ Learning from the debacle, the Canadians decided, and rightly so, against combining gas released from cylinders and infantry attacks for the rest of the war. *Starting at the Battle for Vimy Ridge in April 1917*, gas shells were increasingly used in barrages and counter-battery work to accomplish a variety of tactical missions and eventually became an integral component of the fireplans for 1918.

Meanwhile, for Sergeant-Major Alex Jack the raid remained, "a nightmare, [an] absolute nightmare of a raid... which very much weakened [the division] when Vimy came along."⁶⁵ In that historic battle five weeks later, the soldiers of the 4th were once again tasked to capture the same position. The 4th was the only division not to take all of its objectives on 9 April. Having its best men and most experienced officers machine-gunned and suffocated to death in the aborted raid had destroyed the fighting efficiency of the division, which required many months of restaffing and intensive training to



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regain its form. In addition to four battalions being physically decimated, the morale of the division was nearly shattered.⁶⁶ Faith in all commanders was only barely redeemed by the bravery exhibited by front-line officers during the heat of battle. Whatever General Watson thought the implications of his division suffering a crippling reversal to be, his personal diary contained no clues and very few entries. His only explanation for the failure of the raid was that "the front trenches [were] too far apart." *He had no comments on faulty staff work.* Infantry survivors like Maurice Bracewell realised that something far graver had occurred.⁶⁷

The 4th Division's gas raid was the single most self-destructive Canadian raid of the war. It not only temporarily impaired the fighting efficiency of the 4th Division, but called into question the whole policy of raiding. The most experienced Canadian divisional commander, Arthur Currie, who was soon to be appointed corps commander, had forbidden uncontrolled raiding in the months prior to the Battle of Vimy Ridge. After a study of the after-battle reports, he noted that the results generally did not bear out the casualties to the attackers. More detrimental, it was the best men of the units - the junior officers, NCOs and other ranks - who were generally lost. When necessary, Currie ordered raids to be carried out, but he certainly did not endorse such raids for the simple sake



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Canadian stretcher-bearers, wearing gas masks, bring in Canadian wounded.

of keeping men busy.⁶⁸ Watson's failure to understand this must surely place him, as some of his junior officers noted, in the second echelon of Canadian commanders. Although few have tried to analyse Watson or most of the other Canadian divisional commanders, it seems that he did not share Currie's strong will or desire for intricate planning. Perhaps it was a case, as one junior officer remarked, that "his personality was rather put in the shade by that of his General Staff Officer Grade I - Lieutenant-Colonel E. Ironside. The general opinion was that Ironside was the real commander of the division."⁶⁹ Although overshadowed by the towering Ironside, with more experience Watson learned from his mistakes - perhaps by more closely following Byng and later Currie's direction. Nonetheless, neither Watson nor Ironside, despite being experienced in trench fighting, exhibited good judgement in their planning - a fault that can be directly attributed to their lack of understanding and failure to devise a doctrine for poison gas. Despite an initial foray into the topic, more work needs to be done on Watson and all the divisional commanders in order to ascertain their influence on each of the four divisions and the Canadian Corps in general.⁷⁰

Such an analysis might go some way to explaining the extent to which Canadian success was based on technology, doctrinal and tactical innovations, the good morale of the soldiers, on the structure and size of formations, or the influence of individual commanders.

The spiralling policy of raiding had begun to get out of hand in the months prior to the assault on Vimy Ridge. The harsh rebuke of the Gas Raid of 1 March 1917, happened time and time again to those who had begun to expect results rather than carefully plan for them. As a result, the Canadians learned from their mistakes and returned to the basics of war-fighting. Byng's policy was to train every soldier to know all aspects of the battlefield and his expected role. The Gas Raid was a powerful lesson which drove officers and soldiers to hone their hard-won skills in order to never repeat such a disaster.⁷¹ When the Canadians went "over the top" at Vimy, they would not be blind cattle mounting the slaughterhouse ramp like the men of the 4th Division five weeks earlier; they were to be thinking soldiers, whose commanders relied on the ever-refined doctrine of soldiers leaning into massive artillery barrages, rather than a nebulous gas cloud.

Not only did the raid waste the four battalions, it illustrated exceedingly poor leadership from Watson, Ironside and his staff planners. The naivety of the 4th Division's staff officers was shocking and their flimsy understanding of the battlefield realities of poison gas needlessly threw away Canadian lives. Perhaps the use of this exotic weapon stemmed from a desire to distinguish the most junior division from the rest, but the operational disaster which resulted not only left the survivors wary of gas, but also of the "red tabs" in the rear who foisted it on them. Gas was clearly overestimated, yet it was not a new weapon and it had been used on the Western Front for almost two years. The success of gas in several sensational battles obscured its true status as a useful support rather than "war-winning" weapon, and allowed those in the rear to convince themselves that they had found the solution to tactical problems. Watson and Ironside overlooked the very real and documented failures of gas because they wished it to succeed. They succumbed to that strange act of delusion that occurs when the odds are stacked against you and caution gets thrown to the wind. The rapidly evolving technology of this modern war had ushered in great change, but the interaction of soldier and technology was a dangerous mix if not fully explored first in experimentation, doctrine and training.

Finally, and equally grievous, the failure to heed the advice of experienced front-line officers showed a dangerous rigidity within the division. The success of the 4th Division in later battles, after it had recuperated from the lashing of the March Raid, proved that it had learned the requirements for success: meticulous planning, accurate battlefield intelligence, and the necessity of a combined-arms doctrine based on artillery and infantry working in close conjunction. Still, for the "poor bloody infantry" in the trenches, the rift between staff and front-line officers was deepened. There were few survivors in the 4th Division who would not have agreed with Lieutenant Howard Green of the 54th Battalion that the raid "was just a proper slaughter."⁷²

The string of operational successes by the Canadian Corps beginning with the capture of Vimy Ridge on 9 April 1917, and ending with

the occupation of Mons on 11 November 1918, clearly marked the Canadian Corps as one of the finest fighting formations on the Western Front. With the Australian Corps, it was perceived as the spearhead of the British Expeditionary Force. But before it earned that designation, the Corps learned the hard way, the Western Front way, that success was often bought with the blood of previous failures.

The Germans and their commanders might have been caught at Vimy Ridge in April 1917 with a smug attitude. After all, they had easily repulsed units of the 4th Division less than a month before, and here again were those same British colonials trying to overcome another, larger, nearly impregnable fortress. Perhaps the Canadian reputation, forged in the big battles and trench raids of 1915-1916, had been exaggerated? As Vimy showed, perhaps not.

Notes

1. Bill Rawlings, *Surviving Trench Warfare* (Toronto: University of Toronto Press, 1992) Appendix B. A compilation of Rawlings figures gives 14,301 casualties for Vimy Ridge (9 April to 3 May), 10,607 casualties at Hill 70 (August), and 16,953 casualties at Passchendaele (October and November). The wastage of the trenches accounted for 20,454 additional casualties.
2. As cited in the foreword by Jack English to Shane Schreiber, *Shock Army of the British Empire* (Westport: Praeger, 1997).
3. The phrase has been attributed to General Erich Ludendorff. It was brought to the forefront of the historiographical debate in Alan Clarke's *The Donkeys*. Since then there have been two main camps: those arguing that the British Generals, led by Field Marshal Earl Haig, were by and large "donkeys" with the other camp attempting to explain more sympathetically the policies of attrition in light of the realities of the war. See John Terrain and Denis Winters, for the two opposite ends of the spectrum; however, there are many nuances in between.
4. Macdonell commanded the 1st Division, Burstall the 2nd, Lipsett the 3rd and Brutinel was commander of the Canadian Machine Gun Corps. Brutinel had been trained as an officer in the French army and Lipsett was a British officer and had incidentally been one of Currie's prewar instructors.
5. At the 2nd Battle of Ypres in April 1915, Turner made some questionable decisions. More importantly, he lost control of his division at the Battle of St. Eloi in April 1916, for which the British decided that Arthur Currie would be better suited for eventual command of the Canadian Corps. See Thomas Leppard, "Richard Turner and the Battle of St. Eloi," MA Thesis: University

- of Calgary, 1995 and Tim Cook, "The Blind Leading The Blind: The Battle of St. Eloi," *Canadian Military History*, Fall 1996, pp.25-36.
6. The first Corps commander, Edmund Alderson, played an important part in guiding the fledgling Canadian Corps but he remains relatively unexamined. Despite being pulled between Canadian and British opposing political pressures, he does not seem to have been in the same class as Byng or Currie.
 7. This is the central ground-breaking thesis of Bill Rawling's tactical analysis of the Canadian Corps.
 8. Brian Bond, "Ironside," *Churchill's Generals*, ed. John Keegan (London: Warner Books, 1991) p. 18.
 9. The 1st Division suffered 7,635 casualties; the 2nd Division, 6,816; and the 3rd Division, 6,555. RG 24, v.1844, file 11-1 IB, Casualties.
 10. F.A. McKenzie, *Through The Hindenburg Line* (London: Hodder and Stoughton, 1918) pp.28-9.
 11. Desmond Morton, *When Your Number's Up*, (Toronto: Random House of Canada, 1993) p. 126.
 12. See Herbert Fairlie Wood, *Vimy* (London: Macdonald, 1967) pp.94-106; Rawling, pp. 100-104.
 13. See Tony Ashworth, *Trench Warfare: The Live and Let Live System* (New York: Holmes & Meier Publishers, 1980) introduction and chapter 1.
 14. Pierre Berton, *Vimy* (Toronto: McClelland & Stewart, 1986) p.115.
 15. Morton, pp. 126-7.
 16. See the following for accounts of urine combatting chlorine gas: National Archives of Canada [NAC] Manuscript Group [MG] 30, El 13, George Bell Papers, Memoirs, 27; NAC, Record Group [RG] 41 (Records of the Canadian Broadcasting Company), transcripts for the 1964 *In Flanders Fields* radio programme, v.8, 10th Battalion, J. Sprostin, File 1, page 3; Ibid, v.20, 10th Battalion, L.V.Moore Cosgrave, 112.
 17. G.W.L. Nicholson, *Canadian Expeditionary Force 1914-1919* (Ottawa: Roger Duhamel, Queen's Printer and Controller of Stationary, 1962) p.92.
 18. See James Morgan Read, *Atrocity Propaganda, 1914-1919* (Yale University Press, 1941) p. 196; H.C. Peterson, *Propaganda For War: The Campaign against American Neutrality, 1914-1917* (Norman: University of Oklahoma Press, 1939) p.63; M.L. Sanders and Philip Taylor, *British Propaganda during the First World War, 1914-1918* (London, 1982) pp.167-207.
 19. For the delivery of gas shells see NAC RG 9, v.4976, File 582 (1), 1st DAC War Diary, 31/3/17; The 4th Brigade's regimental history noted that it received 1,000 gas shells at the start of the month. J. A. MacDonald, *Gun-Fire: An Historical Narrative of the 4th Bde. CFA.* (Compiled by the 4th Brigade, C.F.A. Association, 1929) p.82.
 20. See Charles H. Foulkes, Gas. *The Story of the Special Brigade* (London: William B. Blackwood & Sons, 1936) and Donald Richter, *Chemical Soldiers: British Gas Warfare in World War I* (Kansas: University Press of Kansas, 1992).
 21. Richter, p.201. Some of the corporals within the gas companies must have been a little wary of their roles as one anonymous member penned the following epitaph in depicting their work:

Science of the ages, the highest arts of man,
Degraded and prostituted, that Might should take
the van,
Whilst Empire, Justice, Freedom slumbered.
 - Then chemist, student, artisan answered Duty's call;
Our arms, our arts, our poison fumes
Gained Liberty for all.
As quoted in Martin Gilbert, *The First World War* (New York: Henry Holt and Company, 1994) p.440.
 22. G.W.L. Nicholson, *The Fighting Newfoundlanders* (St. John's: Government of Newfoundland, 1964) p.296; Edmund Blunden echoed the same sentiments when, upon hearing a German gas alarm while out in no-man's-land, hurried back to his own line and "shook in the prospect of a retaliation." Edmund Blunden, *Undertones of War* (London: Cox & Wyman Ltd., 1928) p.162.
 23. For the psychological effects of poison gas on soldiers see Tim Cook, *No Place To Run: The Canadian Corps and Gas Warfare in the First World War* Unpublished Masters of War Studies thesis, Royal Military College of Canada, 1996) chapter 6.
 24. NACRG9, v.4182, Folder 33, File 1, G.90/8.
 25. NAC RG 9, v.4182, Folder 33, File 1, "Preliminary Instructions For the Gas Discharge on the 8th Canadian Infantry Brigade Front." pp. 1 -2.
 26. See War Diaries for the 8th Brigade (RG 9, v.4895) and the 4th Canadian Mounted Rifles (RG 9, v.4947).
 27. NACRG9, v.3831, Folder 14, File 3, Gas attack made in successive waves, in Champagne, 31 January 1917.
 28. A search through the War Diaries of the Canadian Corps, 4th Division and 3rd Division, give no indication that the failed raid was reported to other units. Instead, a more successful raid that employed smoke was publicized. It is interesting to note that there was no interaction between the divisions and one wonders if this was an aberration or a regular occurrence.
 29. Berton, p. 126.
 30. For a development of the anti-gas doctrine in the Canadian Corps, see Tim Cook, "Creating Faith: The Canadian Gas Services in the First World War," *Journal of Military History*, September 1998.
 31. Joseph Hayes, *The Eighty-Fifth In France and Flanders* (Halifax: Royal Print: 1920) p.44. Years later one soldier remembered the same claim - "It was a new type of gas, that all rifles and field guns on the German front areas would be corroded instantly, and would be useless." NAC RG 41, 54th Battalion, Alex W. Jack, 1/11. It should be noted that there were no known gases that corroded metal in minutes. Chlorine had a corrosive effect on metal, but that took many days to occur.
 32. The misunderstandings of gas among trench soldiers were so outrageous, that a special investigation was conducted by the French Direction des Services chimiques de Guerre in January of 1918, to examine the claims of soldiers who were subjected to new or extraordinary gases. They found that soldiers often had a very unclear concept of gas and many thought they had seen chemical agents that shot out "electric waves destroying everything" in their path while others described chemical agents which killed "everything in a radius of 200 metres." NAC RG 9, v.3982, Folder 3, File 7, "Report on the Periodical Outbursts of Reports Announcing Extraordinary Discoveries Made by the Enemy."
 33. NACRG41, v. 14, W.M.Marshall, 46th Battalion, 1/8.
 34. NAC RG 41, v. 16, Owen Bingham, 78th Battalion, 2/7.
 35. NAC MG 30, E300, v. 19, Victor Odium Papers, File Gas Attack, Vimy Ridge, Odium to Ironsides, 20/2/17; NAC RG 41, v.20, J. Keiller MacKay, 2/11.

- Lieutenant E.L.M. Burns, a signaller at divisional headquarters, remembered "overhearing General Odium arguing with division for cancellation of the raid, using very stiff, almost insubordinate language." E.L.M. Burns, *General Mud* (Toronto: Clarke, Irwin & Company, 1970) p.40.
36. Private Jack Quinnel, an eighteen-year-old veteran who had survived the Somme, remembered being constantly asked before the battle by French villagers: "When's the gas attack coming off?" Just as the French villagers knew about the upcoming engagement, so too did the German defenders who had been watching the Canadian lines for weeks from their commanding view atop the ridge. Berton, p. 128. Private Ted Baker of the 75th Battalion remembered being shocked at the French people knowing about the raid and remarked, "I guess the Germans knew about it too." NAC RG 41, v. 16, Ted Baker, 75th Battalion, 1/14.
 37. NAC RG 9, v.4907, War Diary of the 12th Brigade, 26 February 1917.
 38. NAC MG 30, E300, v. 19, Victor Odium Papers, File Gas Attack, Vimy Ridge, 11th Canadian Infantry Brigade - Report on damage to Gas Cylinders, February 25th, 1917. The sentries were under orders not to raise an alarm. NAC RG 9, v.4907, War Diary of the 12th Brigade, 1 March 1917.
 39. NAC RG 9, v.3858, Folder 83, File 3, Operation Order No. 27.
 40. The number of cylinders is listed in Richter, p. 175.
 41. NACRG9, v.4814, "Summary of Operations - German Translation of Extracts."
 42. Richter, p.175; NAC RG 41, v.16, M. Young, 72nd Battalion, 1/8.
 43. NAC RG 9, v.3858, Folder 83, File 4, "Messages," 4.44am.
 44. NAC RG 9, v.4942, War Diary of the 54th Battalion, 1 March 1917.
 45. NAC RG 9, v.4943, War Diary of the 75th Battalion, 1 March 1917.
 46. Alexander McKee, *Vimy Ridge*(London: Souvenir Press, 1966)p.41.
 47. NAC RG 9, v.4943, War Diary of the 73rd Battalion, 1 March 1917.
 48. NAC RG 41, v.15, Stephen & MacDonald, 50th Battalion, 1/12.
 49. Other reports even indicated that the Germans had mined some of the gaps and detonated them when the Canadians passed through. NAC RG 9, v.4943, War Diary of the 75th Battalion, 1 March 1917.
 50. NAC RG 41, v.15, Alex W. Jack, 54th Battalion, 1/13.
 51. NAC RG 41, v. 15, Stanley Baker, 54th Battalion, 1/12.
 52. NAC RG 9, v.3858, Folder 83, File 4, Preliminary Report on 4th Canadian Division Gas Raid, 1-2; "Messages," 5.12 am; NAC RG 41, v. 16, M. Young, 72nd Battalion, 1/6.
 53. NAC RG 41, v. 16, M. Young, 72nd Battalion, 1/7.
 54. NAC RG 41, v.15, Stanley Baker, 54th Battalion, 2/2.
 55. NAC RG 9, v.4943, War Diary of the 73rd Battalion, 1 March 1917.
 56. NAC RG 9, v.3858, Folder 83, File 4, Incident Which Occurred After The Gas Operation On The Morning Of 1st March; NAC RG 41, v. 11, 26th Battalion, 5/16-17; NAC RG 9, v.4942, War Diary of the 54th Battalion, 1 March 1917.
 57. Nicholson, *CEF*, p.234. The Canadian Corps War Diary minimizes the high casualties suffered by the raiders. NAC RG 9, v.4814, "Summary of Intelligence for week ending 4 March 1917." Other units in the Canadian Corps got wind of the disastrous raid and Lt. Stuart Thompkins of the 31st Battalion privately recorded in his diary that there were "bad rumours of the raid, hundreds of casualties. The cause not known but apparently the gas never reached the German lines." Stuart Ramsay Tompkins, *A Canadian's Road to Russia* (University of Alberta Press, 1989) p.282.
 58. NAC RG 9, v.4942, War Diary of the 54th Battalion, 1 March 1917.
 59. For an analysis of gas masks in the BEF, see Tim Cook, "Through Clouded Eyes: Gas Masks in the First World War," *Bulletin of Material History*, #47 (Spring 1998).
 60. NAC RG41, v.15, Stanley Baker, 54th Battalion, 1/11.
 61. NAC RG 9, v.3858, Folder 83, Folder 4, B.M. 421.
 62. NAC RG 9, v.3858, Folder 83, File 4, Report by V.W. Odium, 13/3/17. The interrogation of captured German prisoners (of which there were 36) also indicated that "our gas apparently caused practically no casualties to the front companies to which the prisoners belonged."
 63. NAC RG 9, v.3858, Folder 83, Folder 4, G.52-2.
 64. See Tim Cook, *No Place To Run: The Canadian Corps and Gas Warfare in the First World War*, (Unpublished Masters Thesis: Royal Military College of Canada, 1996) chapters 6 & 7.
 65. NAC.RG 41, v. 15, Alex W. Jack, v.54th Battalion, 1/13.
 66. Rawling makes a good point that on 9 April 1917, the 54th Battalion (which suffered 226 casualties in the Gas Raid) fared better than the 87th Battalion, also of the 4th Division, but one of the units that escaped the March Raid unscathed. He makes no account for the damage of the raid on morale of the whole division, however. Rawling, pp. 128-9.
 67. A microfilmed copy of General David Watson's personal diary is held at the National Archives of Canada (MG 30, E69, M-10). Quote from McKee, p.41. See also Morton, p. 127 for mistrust of the generals.
 68. Hugh MacIntyre Urquhart, *Arthur Currie: The Biography of a Great Canadian* (Toronto: J.M. Dent & Sons, 1950) pp. 145-6; Rawling, p. 101.
 69. Burns, p. 15.
 70. Something like Jack Granatstein, *The Generals* (Toronto: Stoddart, 1993) would help place the divisional commanders within context. As it stands, there are three biographies of Currie, one of Byng and almost nothing written about the other senior officers.
 71. Steve Harris, *Canadian Brass* (Toronto: University of Toronto Press, 1988) p. 123; Wood, p. 109.
 72. NAC RG41, v.15, 54th Battalion, Howard Green, 1/10.

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