



The Royal Regiment of Canadian Artillery:  
Individual Inputs = Technological and Doctrinal Outputs

By

Capt C. J. Carter, 4 AD Regt, RCA

The human factor is paramount to all changes that happen within the battlespace. A need is identified and a solution is found. Since 1967, the Royal Regiment of Canadian Artillery (RCA) has evolved tremendously and will be the focus of this essay. From rifling to rocketry, the RCA has improved the profession of artillery by reviewing and improving its equipment and doctrine. Changes in technology and warfare are not bound by rank, which is plain to see by the level of education of many non-commissioned members in the RCA. Moreover, many individuals are seeking further education in their fields either through universities or through professional courses provided by the Royal Regiment of Canadian Artillery School (RCAS) based in CFB Gagetown, New Brunswick. The Royal Regiment of Canadian Artillery has a proud history of innovation and excellence within the profession of artillery and all of its encompassing areas of expertise.

This essay will include not only text based documents but will also include first hand information from members of the RCA. Much of the doctrine for the artillery is reviewed and defined in CFB Gagetown by the very capable instructors and assistant instructors of gunnery. These individuals have many years in their trade and are an excellent source of information from the past twenty to thirty years of the Canadian military. The capabilities of any military are refined from many years of combat. The British Artillery began with smooth bore barrels mounted on citadels

The Royal Regiment of Canadian Artillery began its humble beginnings during the 1750s in Québec where the first company was born. Seven batteries were later stood

up as a result of the Militia Act of 1855 and following confederation, the first two regular force artillery batteries were stood up to form the Royal Canadian Artillery , during 1871. The two batteries were equipped with rifled horse drawn cannons which included 14 pounders. Over the next 40 years several technological advancements were made in the area artillery including the breach loading cannon. In 1897, the first Canadian acquisitioned 12-pounder breach-loading guns were acquired, which resulted in a faster rate of fire. These guns were utilized by Canadian gunners during the Boer war.<sup>1</sup>

The period of time prior to WWI saw more improvements to the weapon systems. The introduction of the 13 and 14 pounders with modern recoil systems meant better



Fig. 1

accuracy and with the attainment of a large training area, what is now a part of CFB Petawawa, the RCA could refine the use of its new technological advancements and define its doctrine. During WWI Canadians discovered target acquisition methods such

as sound ranging, which made Canadians extremely effective at counter battery attacks.

The inter war period was marked by a lack of advancements due to the Great Depression and cuts in military spending. The 13 and 14 pounders were used all the way up to WWII, when again, due to the rust being shaken off of the military machine, a rapid increase in technological advancements began. The Canadian military again purchased the 25 pounder, which could sustain fire longer, had a greater explosive yield and could be delivered to enemies further than its light towed artillery counter parts.

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<sup>1</sup> DND (2009). "The Royal Regiment of Canadian Artillery." Retrieved 4 Nov 09, from <http://www.artillery.net/new/artillery.html>

As one can see the period prior including and prior to WWII was full of change for the RCA. LCol Thomas Bland is seen by some as the father of the RCA. During his time as the CO of B Battery he managed to increase the effectiveness of Canadian artillery and increase the regiment's esprit de corps. There are many more examples. During WWI General McNaughton saw the use of flash spotting and sound ranging. His ingenuity allowed allies to engage in counter battery operations effectively; which ensure that Canadian infantry soldiers would take fewer casualties. The contributions of Canadian Artillerymen have laid the foundation for technological improvements to the scope of the artillery profession.

The individual contributions of some of the early members of the Royal Regiment of Canadian Artillery have had a ripple effect as time progressed. Not to get stuck on one individual, but the contributions of General McNaughton effectively started the surveillance and target acquisition (STA) trade within the artillery. STA has gone from individual soldiers standing on a hill side to unmanned counter battery sound ranging systems known as HALO and can detect incoming mortars and their origin with the MSTAR unit. Without the specific contributions of individuals some technologies may have been introduced by enemy forces, giving allied countries a marked disadvantage.

Many Canadian artillery members have had a direct impact on the development of technologies and doctrine within the Canadian forces, which has subsequently diffused to nations around the world. LGen Sir Arthur Currie is notably an individual who made

changes to army doctrine in WWI which last to this day. As an officer he quickly rose through the ranks to become commanding officer of the 5<sup>th</sup> Regiment, Canadian Garrison Artillery in 1909. Although he transferred to the 50<sup>th</sup> Gordon Highlanders infantry regiment only three years later, he always maintained awareness for artillery capabilities and respect for gunners. He affected doctrine by utilizing rolling barrages extremely effectively during campaigns which he had operational control. He was well known for his meticulous planning and simulating attacks so that soldiers knew exactly where to attack and how to consolidate. Although his command during WWI was primarily concentrated on the infantry, his knowledge of artillery capabilities allowed him to dominate the battlefield by using all assets available.<sup>2</sup>

One of the key members of the artillery that LGen Curry had available to him was Gen Crerar. Gen Crerar, then captain, was noted for using some of the most intricate creeping barrages of the First World War. His ability to plan and execute these fire plans were integral parts of Canadian victories during battles such as Vimy Ridge. Crerar “spent much of the inter-war period at the locus of Canadian military planning and policy,” (DND, Crerar) which culminated in WWII with the creation of the first Canadian army; the largest Canadian army in history. Although some critics believe that Crerar was not an adequate leader in battle, some believe that he was a good staff officer. During his time as a staff officer he was placed in critical roles pertaining to the development of

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<sup>2</sup>Keirstead, M. “*Lieutenant General Sir Arthur Currie.*” Retrieved 6 November 2009, From <http://www.worldwar1.com/bioccurr.htm>

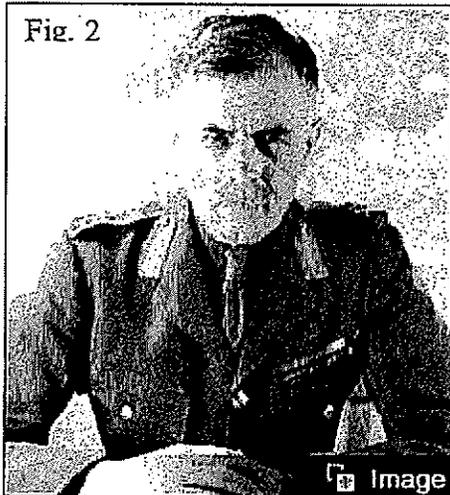
RCA Museum. “LGen Sir AW Currie GCMG, KCB (1875 – 1933).” Retrieved 6 November 2009, from <http://www.rcamuseum.com/English/Great%20Gunners/currie.htm>

military doctrine. Due to his relative lack of combat experience, in comparison to his British counterparts, Crerar “devolved much to those subordinates with respect to the planning and conduct of battle.” (DND, Crerar)

Of both world wars, WWI was the most important engagement in Canadian history as it pertains to the combat effectiveness and recognition of Canadian soldiers. Not only did it showcase our combat capabilities but our ingenuity as well. Members of the Royal Regiment of Canadian Artillery continue to learn from previous wars; in fact one of the fastest growing fields within the RCA is surveillance, target and acquisition, which was utilized greatly by Canadians during WWI. There are several facets of this trade, such as, counter-battery radars, unmanned aerial vehicle, and radar that are present today because of the importance of the STA was realized early in Canadian military campaigns. This early realization allowed Canadians to be leading global members in this field. STA is the fastest growing technological area within the Canadian Forces.

General McNaughton’s “work in devising innovative techniques, new equipments and the use of aircraft to locate enemy guns,” (RCA Museum) was critical to the indoctrination to of STA to the Canadian military. Although some of the techniques, such as aerial surveillance, were not new to warfare, McNaughton utilized other assets such as sound ranging and flash spotting to acquire accurate intelligence on the location of enemy batteries. In response to this intelligence, allied guns could then eliminate German gun positions and increase the likelihood of a successful attack. McNaughton’s contributions to the Canadian military did not end with counter-battery operations; he also influenced

the development of the discarding sabot projectile which was used for anti-tank engagements.<sup>3</sup> Although he is criticized for his planning with regards to Dieppe, his contributions to the Canadian military were factors in the successes in both World Wars.



Following the Great War, McNaughton, at the time Major, proceeded to affect the doctrine within the Canadian military by engaging in the creation of the Counter-Battery Office. This office could be so effective because it “was...highly organised and influential, the CBO was able to take the lead in the fight, which [is what] led to such impressive

results.”(Little, 3) By placing the responsibility of counter-battery into a specialized unit, McNaughton ensured not only the birth of the STA but also that there would be a response to incoming artillery fire engrained into Canadian artillery doctrine. The CBO calculated data in order to deliver viable target data to the guns to be destroyed. This undoubtedly saved hundreds of allied lives during both of the world wars.

The use of sound ranging is more than simply relying on a Counter-Battery Staff officer to site a muzzle flash and time the corresponding sound associated with that flash.

During the WWI, technological improvements were made to the age old tradition of look, watch and time. Sir William Bragg, Sir Charles Darwin and Professor Lucien Bull

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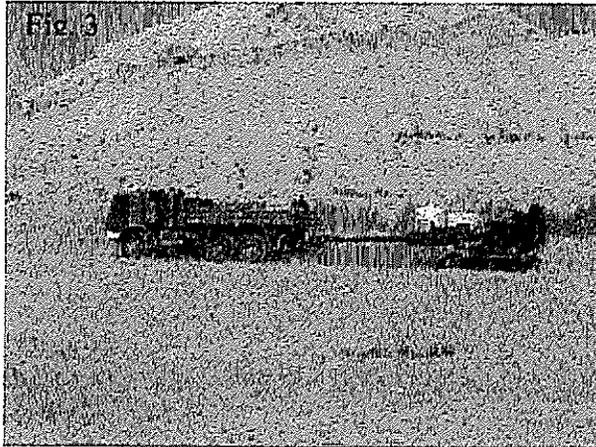
<sup>3</sup> Juno Beach Centre (2003). “General Andrew G.L. McNaughton.” Retrieved 09 Nov 09, from <http://www.junobeach.org/e/3/can-pep-can-mcnaughton-e.htm>

contributed their own sound ranging technologies. Although the British high command shied away from new technologies, trusting in tried and true fashions, the sound ranging device proved very accurate in good weather. The device consisted of three microphones, which once had sound wave travel over them would triangulate the origin of that sound. This technology made counter battery efforts faster and more accurate. However, the new technology did have its drawbacks; in rain or windy weather the device would give inaccurate readings and the set up for the device was extremely labour intensive. Thus, in order to ensure that the device worked properly, it was used in association with flash spotting.<sup>4</sup>

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<sup>4</sup> Maj Little, Richard. "*A Short History of Surveillance and Target Acquisition Artillery.*" Retrieved 09 Nov 09, from [http://www.army.forces.gc.ca/caj/documents/vol\\_11/iss\\_3/CAJ\\_Vol11.3\\_08\\_e.pdf](http://www.army.forces.gc.ca/caj/documents/vol_11/iss_3/CAJ_Vol11.3_08_e.pdf)

Canadian technological and doctrinal improvements have been driven by the conduct of war. It is a trend that in times of need Canada binds together and turns on the gears of war to ensure victory; however, as soon as a conflict ends the Canadian military suffers



from budget cuts or a decline in public support. During the interwar periods there were very little improvements to Canadian technology and doctrine as it pertains to the artillery. Due to many years of budget cuts and shifts in political will, the thought was

emphasized on doing more with old materials at hand. Currently Canada still uses the 105mm C2 which was in use during the Second World War. In fact the original 105mm C1 was a German design used during WWI. Adaptations have been made to the barrel to increase the range in during the post WWII period. This design is known as the 105mm C3. Canadians are well known for being able to produce results with older technologies. By making slight changes to the weapons that we do have we increase their longevity and maintain the skill sets that essential for that particular weapon. The newest weapon delivery system that Canada acquired is the M-777, 155mm howitzer.

Compared to its size it is a relatively light howitzer. It is capable of delivering projectiles upwards of 40km, depending on the ammunition in use. It can be air lifted; which speaks to its mobility and does not need to have line passed from a director, due to an onboard gyro system. It further integrates into today's high tech world by allowing soldiers to

connect to the command post through their digital gun management system, which relays all fire orders to the guns without verbal communication. The most important advances in technology as it pertains to a military in general come from the private sector.

However, private corporations need to know what advances to make, what the particular need is from militaries. Do they make heavier guns or lighter? Do they produce 155mm or 105mm howitzer guns? The answers to these questions arrive from annual gunnery meetings.

At the meetings or seminars, gunners and gunnery officers with sufficient time in service and experience come together to discuss doctrine and methods of employing current technology or potentially acquiring weapons. Many of these individuals train gunners on the weapon systems on a daily basis, such as the assistant instructors of gunner or the instructors of gunnery located at the Royal Regiment of Canadian Artillery School, located in CFB Gagetown. Through deployment and constant training on a wide variety of artillery equipment these subject matter experts have a direct link through the chain of command to effect policy. Frequently these military members have been summoned to Ottawa or Kingston to have a direct influence on artillery doctrine.

The contributions of individuals in the Royal Regiment of Canadian Artillery have been numerous since confederation. From smooth bored canons to the M-777 and flash spotting to UAVs, technological advancements have incrementally increased over the past century. It is only through constant change that the RCA can maintain its combat effectiveness and that change is spearheaded through openness of our chain of command

to accept, deny or explore recommendation and suggestions from all rank levels. It is through this input that change commences, but it has to be a continuous process. If information stops in the chain of command then the RCA runs the risk of being out of date in its practices. In today's battle space that is an unacceptable risk and will put the lives of every gunner in undo harms way.

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## FIGURES

1. Dean, Michael. "*Members of "B" Troop, 5th Field Regiment, firing 25-pounder near Malden, Holland, 1 February 1945. From left to right: Sergeant Jack Brown, Bdr. Joe Wilson, Gunners Lyle Ludwig, Bill Budd, George Spence, and Bill Stewart.*" Retrieved 17 Nov 09, from <http://www.junobeach.org/e/4/can-tac-art-tfp-e.htm#null>
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