



## 5. The 'Counter Blaster' and Counter-Battery Work

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### Introduction

Before the war, the British army virtually ignored firing at enemy artillery. *Field Artillery Training* had only seven paragraphs on the topic, and *Field Service Regulations* none. <sup>1</sup> The artillery's main objective was not mastering the enemy's batteries, but aiding the infantry in building up fire superiority over the whole of the enemy's forces to permit "the climax of the infantry attack." This might involve shelling enemy guns, but such a gun duel was secondary in the battle as a whole. Since the artillery's role might be firing at enemy infantry or guns according to the broader tactical needs of the battle, the artillery was only responsible for the technical details of its work; others would choose the targets, and the artillery had only to hit them. Throughout the war the effort devoted to suppressing the German artillery fluctuated, but it fluctuated according to the perceived needs of the attacking troops, not the artillery's wishes. In the first two years of the war scarce resources meant the artillery could only rarely perform any task satisfactorily, and counter-battery (CB) work was largely an afterthought. After the Somme battles displayed the tremendous artillery power on both sides, a new system delegated counter-battery work solely to the artillery. But this was only a delegated responsibility: while counter-battery work was handled by the artillery, it was done within parameters set by others, typically the General Staff in coordination with the corps or army commander. Eventually, however, everyone associated with the war effort saw how vital mastering the German artillery was, and extraordinary efforts were made. Gunners constantly sought new counter-battery methods, and when these came to fruition the rest of the army could change their tactics.

### Pre-war Conditions

The experiences of the Boer War led to the pre-war lack of emphasis on counter-battery work. The British had tried 'artillery duels' against the Boers, and had encountered serious problems. The Boers protected their guns well, typically digging well-concealed positions for individual artillery pieces. This had a two-fold effect on the British: first, it was hard to spot the Boer guns; second, it was hard to damage them with the small numbers of shells available. The Royal Artillery ended up spraying the *kopjes* of South Africa with [shrapnel](#) in an attempt to suppress the Boer artillery rather than destroy it. On the other hand, the Boer artillery posed little threat to British infantry. The Boers had very few guns, and dispersing them made it hard to concentrate their fire. The result was essentially only harassing fire. Long-range fire certainly annoyed British infantry and cavalry, but the very small results unfortunately led them to underestimate artillery's potential. They had been extremely sensitive at the start, even to slow fire from single guns, but rapidly became desensitized because experience showed that they suffered very light losses from shellfire. After the Boers' defeat, the idea of the artillery duel died. It had, after all, been proved not only ineffective but unnecessary. There was no foreseeable need for an artillery duel in colonial warfare; the Boers were as technologically advanced as any small country, and if it were superfluous against the Boers it would be superfluous elsewhere too. More seriously, it was also dropped for European warfare. While the pre-Boer War ideas had harked back to the massed batteries of the Franco-Prussian War, the post-Boer War doctrine took the simplistic view that the British would always have some superiority in artillery against a European foe. As one participant bitterly noted after 1918, "The occasional mutual contest of field batteries was all that was foreseen by our pre-war manuals." <sup>2</sup>

If the doctrine had flaws right from the start, the tactical methods of executing it would shortly be obsolete. Most enemy batteries were expected to be in the open, or at least only partly concealed; these were to be shelled "till [their] fire is mastered." <sup>3</sup> Neutralization was

explicitly the goal, with the implicit assumption that the advancing British infantry would capture the silenced enemy guns. Destruction was vaguely considered possible, but neither critical nor likely. Heavy artillery would be needed if enemy guns were dug in, but the main target (even in a siege) was still enemy personnel; destruction and neutralization were thus confused. Part of this was the British army's obsession with shrapnel, which could kill gunners but would rarely damage guns. A bigger problem was the conceptual fog surrounding the form of future battles. In a one-day battle, a gun with its crew killed was indeed knocked out, but in a month-long battle minor damage could easily be repaired and new gunners assigned. Since several battles in South Africa had lasted over a week, as had battles in Manchuria and the Balkan Wars, the British army was ignoring the evidence. The bottom line was that enemy guns were not viewed as targets, and nobody had thought about destroying gun emplacements. Even during sieges, the artillery was ignored and the enemy infantry was targeted instead. <sup>4</sup>

These ideas were hardly revised in the light of the Russo-Japanese war, where artillery had been withdrawn from direct-fire positions. The two sentences in the pre-war artillery manuals that suggested shelling enemy observation positions presumably solved the problem of concealed guns.

### 1914: Experience from Battle

In 1914 these relatively simple methods worked as long as the Germans put their batteries in the open. At Néry, 'L' Battery RHA won immortal fame and three Victoria Crosses by blasting a German battery at point-blank range. It helped that both sides deployed at night and did not know about the other, but this was hardly going to be true for the rest of the war. At Le Cateau the British were not the only ones to deploy their batteries in open positions, and German batteries were shelled until the British [guns](#) changed targets to help their own infantry. <sup>5</sup> Even though the German guns were in plain sight, two other British preconceptions were proven faulty: the Germans not only had more guns, but the British fire failed to silence them. But these were the exceptions, and the British soon found themselves having to deal with German artillery deployed out of sight.

The terrain in the Aisne region revealed further problems. <sup>6</sup> Because British weapons had been optimized to fire shrapnel, they generally had flat trajectories. With the deep, narrow valleys of the region, the British guns had to deploy on the narrow hilltops because they could not fire out of the valleys. The shortage of communications equipment meant the batteries had to deploy close behind the front line; the limited range that the British had accepted as part of optimizing the artillery to fire shrapnel also necessitated forward positions. But the Germans held the higher ground and their observers could see British batteries and direct effective fire. The Germans had some of the same problems, especially with the terrain, but they had a higher percentage of high-trajectory [howitzers](#) that could deploy in the valleys, out of sight of Allied observers.

Since the 18-pounders were so vulnerable to German counter-fire, the British response was limited. Only the longer-ranged 60-pounders were of much use; at one point Sir John French personally organized all the 60-pounders to engage German batteries in rotation, and Haig several times personally organized counter-battery fire. <sup>7</sup> The RFC helped spot batteries, marking locations on a gridded map for later shelling. The pilot would scribble on his map, circle back behind friendly lines and drop it, hopefully near a headquarters. Choosing which German battery to hit first was the first serious command decision entrusted to divisional CRAs.

During most of the autumn and early winter the Royal Artillery was simply too busy directly supporting the infantry to pay much attention to counter-battery work. Counter-battery fire would have been helpful, but other things were more critical. In the advance to Ypres, the

artillery was usually divided into penny-packets, working up with the infantry—even single guns were pushed forward to boost infantry firepower. Since infantry lacked the firepower to deal with defensive machine-guns, the attackers needed artillery to even the odds, and while defensive artillery fire posed a problem, it was less urgent than destroying or suppressing machine-guns. Most divisions formed infantry brigade-groups (an infantry brigade, an 18-pounder brigade, and engineer and signal elements); these were technically temporary, but "the battle was mainly fought in these groups." <sup>8</sup> With field artillery parceled out, central commanders had only the 60-pounders and field howitzers; once heavy artillery arrived it was too precious for secondary missions like counter-battery fire. Once the fighting at Ypres died down, batteries pulled back a bit and better communications made it easier to concentrate fire. <sup>9</sup> Communications were vital for concentration and centralization, and calls went out swiftly for improvements. General Smith-Dorrien in November 1914 urged more signallers for the artillery because German "artillery fire has been more concentrated and more flexible," and he wanted the same advantages. <sup>10</sup>

At this time there was a feeling that, since it was not directly supporting the infantry, CB was a lesser form of artillery fire. In addition, counter-battery work was somehow 'defensive' (it did, after all, react to the enemy) and therefore inferior. The BEF hoped to regain the initiative and free its artillery from merely neutralizing German guns. <sup>11</sup> This is a reminder to us that counter-battery fire in this period was simply retaliation to make Germans cease firing, not an attempt to aggressively destroy guns. Combined with the desperate shortage of shells, there was virtually no counter-battery fire—at one point most counter-battery work in the Ypres area was assigned to the three guns of an armored train—but this was only a response to the pressures of the situation. <sup>12</sup> It would not have benefited the BEF, or the Allied cause, if the Royal Artillery had been focusing its resources on a counter-battery fight and left the infantry unsupported when the line was broken. Artillerymen realized there was no point in a gun duel that did not help win the battle; if the pre-war idea was wrong in its outline and details, at least the objective was correct. Under the circumstances, infantry support was the critical task, and thus it was the artillery's top priority.

Since there was hardly any artillery to spare, there was no pressing need for a command and control system. A CRA was responsible to his division commander for artillery matters within the division (and by extension within the divisional sector), and he handled them unless they were devolved to brigade-groups. But counter-battery fire was substantially divorced from the divisions, although not formally. The heavy batteries were rapidly split off from their divisions. Some fell under corps command, while armies grabbed the rest. For instance, the heavy battery of the 1st Canadian Division wandered among ten different corps for over a year, and the 2nd Canadian Division lost its battery for a similar period. <sup>13</sup> Demand was so high that many heavy batteries from the newly forming Kitchener Armies went abroad ahead of 'their' divisions. <sup>14</sup> Because the existence of the brigade-groups had led to a mental association of the 18-pounders with infantry support, and with the 60-pounders taken away, the CRAs had few assets for counter-battery fire. Moreover, depending on local arrangements, they might not have the responsibility.

The winter of 1914-15 was generally quiet, with both sides learning about trench life and hoarding shells. Each felt the other had the upper hand. During the winter all heavy artillery (everything manned by the RGA) were consolidated, at least on paper, into "Army Artillery." <sup>15</sup> Armies did not command this directly, but formed Heavy Artillery Reserve Groups under brigadier-generals. <sup>16</sup> Often heavy artillery was not even commanded by the HARG, but was turned over to the corps, and since there was no subordinate headquarters in the corps to cope with the added responsibility, they might hand the artillery over to the divisions. The result was organizational chaos, with guns split four ways without rhyme or reason.

Early in 1915 armies controlled counter-battery work, and held on to some guns, but this

did not last long. The system eventually shook down so that armies were equipped with the heaviest artillery, the corps with medium howitzers, and the divisions were assigned medium guns, the main counter-battery weapons of the period. <sup>17</sup> Thus the divisions resumed command of 60-pounders, but probably not the battery they had previously commanded. Moreover, new batteries were arriving, and units were being moved around as operations required, so there was only limited cohesion. At least some divisions started offices to control the counter-battery effort, but the shuffling of responsibility, the movement to-and-fro of batteries, and the shortages (of shells, guns, and staff officers) meant that efficiency stayed low. <sup>18</sup>

Counter-battery work was still not a high priority, largely because the German artillery was also short of shells and was thus not producing much firepower; since enemy machine-guns were not short of ammunition, the British focused on those. (One example of the Royal Artillery's situation was the battery that was allotted thirty-two shells per day to keep thirty-five German batteries silent.) <sup>19</sup> Direct support of the infantry was still a higher priority. In ordinary trench warfare, if the German guns were active the British would "retaliate" against some sector judged to be "tender." Because the British counter-battery effort had been so weak, the Germans still had a good number of batteries deployed forward, even in sight of the British front line. If those batteries fired, then neutralization could indeed be directed at the 'offenders.' Also, the Germans usually posted batteries near villages, so the village could be bombarded to express British disapproval. This forward deployment of German artillery was a sign of Allied counter-battery impotence, and the Germans pulled back when their casualties mounted. Once the German batteries withdrew from sight, British options dwindled basically to one. Since the offending battery could seldom be directly identified, the only option was to shell something that annoyed the Germans as much as the German shelling annoyed the British. This points out the weakness of artillery intelligence sources in the period, which were restricted to direct ground observation, pilot's eyeballs, primitive aerial cameras, and artillery officers cupping their ears.

### **1915: Shortage of Materiel**

Even when the BEF attacked, counter-battery work was a lower priority than bombarding German trenches. The first significant British trench warfare attack was at Neuve Chapelle, towards the Aubers Ridge, from 10 to 12 March 1915. There were several important firsts, but a heavy counter-battery effort was not one of them. The key element of the German defenses was the infantry, firing rifles and especially machine-guns; their artillery helped in the defense, but was not decisive. As long as the main strength of the defense was the frontline infantry, they would be the Royal Artillery's main targets. <sup>20</sup> Moreover, the few German batteries in the area were already known. At best they were in only semi-covered positions, and the British could identify their positions when they fired. Under these circumstances most British medium guns shelled the German communications routes instead of the German artillery. Not only was it very important to delay the arrival of German infantry reserves, but when the German guns did fire they could be quickly identified and targeted. Only two batteries of 4.7-inch guns were assigned to counter-battery fire, and for one it was a secondary task. <sup>21</sup> Yet in a foretaste of how changing German tactics would force British responses, the Germans reinforced their artillery around Neuve Chapelle, and by 12 March all but seven of the British heavy pieces were allotted to counter-battery fire. <sup>22</sup> Partly this was due to the changed circumstances of the battle—since the British infantry was no longer attacking, the German infantry was no longer the main enemy. The machine-guns that had been so deadly had no targets, while the German artillery was a real threat (especially since the Germans might counterattack, in which case their artillery would play a vital role).

The British repeated the attack up Aubers Ridge in early May. This time there was a counter-battery program, involving several batteries. Since there was not any more artillery available

at Aubers Ridge than at Neuve Chapelle, using more of it for CB shows its growing importance. In a new wrinkle, a 60-pounder battery was assigned to work with an airplane that would watch for any previously undetected German batteries. <sup>23</sup> Despite the new methods, better plans, and larger share of the resources, the counter-battery effort at Aubers Ridge fell short of what was needed, and the promising steps were not followed up. Festubert similarly brought no lasting improvements in counter-battery work.

By the end of May, the BEF was at least partially moving away from its retaliation/neutralization counter-battery policy. Now when preparing for an attack the goal was to destroy German guns, but this was desirable for its "morale effect." <sup>24</sup> Presumably the British infantry would be somewhat encouraged, and the German infantry somewhat discouraged, but this reveals that the stated reason for reducing enemy firepower was not saving lives but improving morale. Whatever the reasons given, in mid-1915 the shell shortage meant that the necessary shells simply did not exist. It is also important to note one other part of the new doctrine: destructive fire would be used before an attack, when there was time to adjust fire; during an attack, when the infantry needed enemy fire suppressed, the counter-battery guns shifted to neutralizing fire. This was a solid two-part plan and would be the basis of future counter-battery doctrine.

Counter-battery work was not yet a high priority, however, because there were more important things to worry about. Through 1915 the Germans were improving their defenses, first digging sturdier trenches, then digging them in greater numbers. Machine-guns, the backbone of the German defense during the British infantry assault, were getting harder and harder to hit. But the Germans had the same industrial bottlenecks the British did and were not expanding their artillery at the rate they were producing more machine-guns. The machine-guns had to be overcome, or infantry attacks were doomed, while German artillery was less certain to cause problems. Between attacks in trench warfare it was possible to identify German batteries and accumulate enough shells to hurt them. But for an attack, when every shell was desperately needed for bombarding trenches, CB took a back seat. Under these conditions there was little prospect of destroying German artillery, nor were there shells enough even to make a methodical attempt. Instead, orders were issued merely to respond to German fire. Even during the battle of Loos in late September, I Corps told its gunners "be prepared to reply" if the Germans opened fire. <sup>25</sup> This may have been all that was possible, but it was still woefully inadequate.

Throughout 1915 the BEF was trying to deduce what the proper method for countering German batteries should be, but everyone recognized that the answer (whatever it was) could not be used until more materiel was available. <sup>26</sup> There was progress in identifying guiding principles, but there was no linkage to actual operations. At Loos, IV Corps made no efforts to arrange counter-battery work, nor did it encourage divisions to do so. <sup>27</sup> After that battle more attention was paid to counter-battery work, guns were earmarked for it, armies started keeping "Active Hostile Battery" lists, and daily reports began. <sup>28</sup> The problem had finally become important enough to earn attention. Although the Germans had not reinforced much before the British attack (they thought the British bombardment was so light it was only a feint <sup>29</sup>), because operations on the Eastern Front had gone well they had plenty of forces to respond once they found the BEF really was attacking. The German artillery only suffered "very slightly," and more artillery arrived on the second day of the battle. <sup>30</sup> While rifle and machine-gun fire was enough to stop most British attacks, the growing strength of the German artillery and the stagnation of the front after the initial attacks, which made artillery more important than infantry, focused British attention on counter-battery fire. One bad habit continued, that of using only medium guns (the 60-pounders and old 4.7-inch guns) for CB. The BEF had drifted into this since, without any chance of destroying their guns, neutralizing German gunners with shrapnel was the most efficient solution, and only medium guns had the requisite range. The habit evolved in 1916

into earmarking solely medium guns for CB (although enough howitzers became available to allow destructive fire), forgetting the original conditions that had caused the policy.

### **1916: Grappling with Organization**

Conditions changed in 1916, namely in that the British had both more shells and guns and new command arrangements. Most importantly, however, new German tactics forced new answers. Bombardment was still the Royal Artillery's main job, with counter-battery work coming in far down the list. Attacks might be defined by the available artillery—100 yards of front per heavy howitzer—but counter-battery requirements were not mentioned. From February on there was a new command system at the corps level that should have centralized counter-battery control there, but the brand-new system was untried. Responsibility was still divided between corps and divisions, with II Corps for instance leaving retaliation to divisions but taking charge of planned destructive shoots itself. Alternatively, when covering a raid, the division might control the counter-battery effort as well, since they better understood the local situation. [31](#)

In the seven-day bombardment before 1 July when the Somme offensive began there was little counter-battery work. Counter-battery fire was the third priority, behind harassing fire and wire-cutting, indicating a return to the priorities of mid-1915 rather than learning from the later stages of Loos. [32](#) Although the preparatory bombardment was lengthened due to bad weather, the extra effort was put into bombarding trenches, not German artillery. Each corps in the Fourth Army decided how it wanted to conduct counter-battery fire, which inevitably produced significant variations. Some paid hardly any attention to the subject, being quite busy enough bombarding enemy defenses, cutting barbed wire, interdicting communications, firing feint barrages, and planning infantry support. Since the British plan was to break through rather than capture a portion of the German line, the entire depth of the German position had to be bombarded, which increased the number of targets, which then increased the priority of trench bombardment still higher.

For those corps that did make a significant counter-battery effort, the main goal was neutralization, often by retaliation. [33](#) This would kill German gunners and might damage guns, but with the few resources available nobody expected much destruction. (This was a half-step back from the principles laid down in 1915, which shows they had not been entirely accepted. Before the Somme, there would be destructive counter-battery fire only during ordinary trench warfare, but during both the preliminary bombardment and the actual attack the goal was neutralization.) Planners realized that the counter-battery resources were still inadequate for sufficient destruction before Z Day, which forced a decision on how best to reduce the effectiveness of the surviving German guns. Some corps thought it was best to force German batteries to move to secondary positions because confusion, disorganization, and supply problems would reduce their effectiveness. Other corps thought it better that the BEF know where the German guns were located so that neutralization could be ready for Z Day. X and XIII Corps had clever plans to fire on German howitzers (which were most dangerous to infantry in trenches) before Zero Hour and neutralize field guns (the bigger threat to troops in the open) as the infantry advanced, while VII Corps had exactly the opposite idea. [34](#) Also, some gas would be used for neutralization on Z Day since wearing gasmasks would significantly hinder German gunners, thus reducing their rate of fire and therefore their effectiveness. This was not the cloud gas (released from cylinders in the British front line) that had been so disappointing at Loos. Now a limited supply of gas shells was available, some from the French (who gave the shells and lent some 75s) and some for the British 4.5-inch howitzer. Using the field howitzer was a limited step away from the previous situation in which only medium guns were used for counter-battery fire.

Over the course of the four and one-half months of the Somme campaign, the need for

effective counter-battery fire, both destructive and neutralizing, grew. The German defensive barrage was not the biggest problem on 1 July, but later in the Somme campaign, once the British artillery pulverized physical defenses, the Germans relied more on their artillery in defense. They also bombarded before counterattacks, much as the British bombarded before attacks, so in order to hold captured ground the British had to control the German artillery. Counter-battery priority rose dramatically. It became typical for neutralizing CB to begin at Zero Hour or even slightly before, although some corps in the Fifth Army took the bolder step of waiting perhaps three minutes after Zero and neutralizing only those German batteries that opened fire. This had the benefits of not wasting British shells, catching the German gunners in the open at their guns, and disguising whether the barrage on the German front lines signaled an assault. <sup>35</sup> This approach it was soon dropped, however, because it gave the Germans the first few minutes to blast the British infantry; the idea was just too risky to be widely adopted.

Destructive CB was also done during the campaign, but in the lulls while the infantry regrouped. Since the intelligence organization could not pinpoint German batteries fast enough, success was limited, especially since German batteries tended to move rather than be annihilated. This could actually cause more problems than it solved if the new German positions were unknown at the moment of assault, as the relocated batteries were not hampered by British counter fire. Late in the Somme offensive this problem was recognized, and the solution was straightforward: stop the destructive fire after a certain point, note German battery locations, and hold fire until Zero. The German guns would receive a prescribed period of neutralizing shelling, after which the British gunners would rest but be ready to fire again on any German batteries that started firing. <sup>36</sup> Unfortunately, for various reasons—mainly pressure from higher command, it seems—this would not be fully adopted for some months.

CB was definitely drawing high-level attention. Armies had to adjudicate boundaries between corps, <sup>37</sup> and one MGRA took an active role in fostering thoughtful staff work. Virtually all the corps that passed through the Reserve Army (later the Fifth Army) during the Somme started filing a number of daily reports, several of which were important for counter-battery work. <sup>38</sup> They became more organized, largely due to the influence of Major-General Herbert Uniacke. He demanded categorized daily reports of British and German activity, information on bombardments, friendly counter-battery fire, and its effects. (Later Uniacke relaxed his paperwork demands; he was clearly getting the artillery to work methodically, and not simply reveling in paperwork.) The methodical thinking that Uniacke forced provided the basis for informed changes rather than guesswork. There is no indication that Uniacke influenced Gough's choice of attacks, but he certainly made the best use of the artillery he had, both on the Somme and later.

Uniacke's reports were an important first step towards the elaborate and thorough intelligence system that would support counter-battery work in 1917. The Royal Flying Corps was vital, and had to be integrated into the effort in order to be put to best effect, but ground and air methods had to be tested, improved, and then standardized. Intelligence was growing in importance, which led to more conferences involving more specialists, a process that expanded (and became more systematic) in 1917. However, it was at corps—the operational, executive level—that CB burgeoned in 1916. At first some Heavy Artillery Groups (almost always with medium guns) were dedicated to counter-battery work, but still with no staff beyond their own small one, which was largely administrative. A corps would set one HAG to handle CB on the whole corps front, but leave the HAG to its own devices. To handle the workload, special staffs were improvised, and eventually they would be approved and increased. Experience was gained, but it was at junior levels in the hierarchy and erratic. The HAGs also suffered seriously from an organizational quirk. Since most observation and reconnaissance aircraft reported to Corps Wings, it was the corps artillery headquarters that had intelligence information, not the HAG that needed it. <sup>39</sup> There were times when the

higher command got involved, especially when new weapons had to be integrated into operations. The tank was the best example in 1916: doctrine governing its use appeared straight from GHQ, but it was largely a product of tank pioneer Ernest Swinton's proposals. He was aware of the tanks' weakness against artillery fire, and wanted tank assaults to be supported by particularly heavy British counter-battery efforts. He got what he wanted. Not only did he have GHQ's backing, but the whole counter-battery effort was part of the tradition of artillery supporting other arms. As usual, the Royal Artillery was implementing other people's priorities. [40](#)

The Somme offensive pointed out the growing need for British counter-battery improvements, but much of the development was on quiet fronts. This is not surprising, as the short-handed staffs struggling with day-to-day problems in the Somme battles had little spare time for contemplation. In the quiet Ypres Salient, the Second Army integrated the RFC into the flow of battle—not just pre-arranged shoots—via the system of "[zone calls](#)." These allowed batteries allotted for contingencies to fire on opportunity targets. [41](#) This was over a year before the Somme, but with the problems of 1915 (lack of resources and a hazy chain of command) still in effect, developments were slow. Further, in quiet sectors the goal was destruction of German guns, rather than their neutralization during an attack. Accuracy—through all the technical aspects of gunnery—was the goal, since the few shells available needed to be used to greatest effect. The benefits of adjusting for meteorological conditions, propellant temperatures, gun wear, and other variables were more obvious in quiet sectors. In active areas there was enough ammunition, and pinpoint accuracy was less important when the mission was saturating an area and suppressing the Germans. Since the main battles were first in line for ammunition, scarcity in the quiet sectors encouraged accuracy and good gunnery.

Experience was distilled into rules of thumb. For instance, to destroy a German gun-pit took 100 6-inch howitzer rounds, 80 8-inch howitzer rounds, or 60 9.2-inch howitzer rounds. On top of this HE fire, a bit of shrapnel from medium guns was added to kill and wound German gunners. This was a step in the right direction, away from the common 1915-16 error of relying purely on guns for all counter-battery work. It seems to have developed in the quiet sectors, which had fewer medium guns and also were seeking the destructive effect that the larger howitzer shells could provide, but it spread to the Somme. Later in the Somme campaign, once the German trenches had been obliterated, there were howitzers available for counter-battery fire, especially in the pauses between infantry attacks. There was still the tension between destructive counter-battery fire and knowing where German guns were during an attack so they could be neutralized, but better intelligence work helped solve the problem. Overall, however, the earmarking of just medium guns to CB faded, allowing guns and howitzers each to be used as circumstances demanded.



Another development that came from outside the main areas of battle was [Sound Ranging](#) (SR), the detection of guns through the sound waves generated by their firing. The Third Army, around Arras, was something of a haven for men with new technical ideas. The MGRA, Arthur Holland, had himself been involved in abortive sound ranging attempts as early as 1914, and he also supported innovators in mapping and other topics. Perhaps too much should not be made of the development of SR in a quiet sector, for some methods that worked on quiet fronts were technically unsuitable for active ones. Sound ranging in particular was nearly useless if too many guns were firing at once, and it also required pauses in friendly firing. Such accommodations were unlikely (to say the least) to take place in the midst of battle just so that scientists could experiment. The Third Army was also a leader in keeping an updated, consolidated army-level map of all active German batteries.

During the war maps became vastly important. First, new, more accurate maps were needed; most of Belgium had not been mapped since the 1830s, and northern France was a

hodgepodge of old and new surveys. Not only had mapping techniques advanced, but villages, towns, and cities had expanded, roads had been built, and many terrain features altered. Once the BEF had its first rough survey it continued to improve the maps, and had to update them as new trenches seamed the landscape. <sup>42</sup> In 1914 GHQ had the only topographical section; by 1915 each army had one, and in 1917 each corps received one. Beyond mapping, survey was important for artillery. If gunners wanted to shoot 'off the map,' they needed to know where they were and where the enemy was. At first not thought to be of much use for guns in the field, by 1917 survey was the key to new tactics. Survey Sections were given to corps in 1917, and by 1918 they were even divided amongst divisions, with partially-trained artillery personnel helping. <sup>43</sup>

One great benefit of the quiet sectors of front in 1916 was the time it gave for training the New Army and Territorial Force gunners. It also allowed some corps to develop tremendous local knowledge. Since many British corps occupied their front for a considerable time, they became experts on the geography, German actions and reactions, and local minutiae. This knowledge could be exploited once conditions changed. X Corps was perhaps the best example: after their five-hundredth counter-battery shoot in the same area, they wrote a report on all the changes that had taken place in the past ten months and analyzed the trends. <sup>44</sup> On the other hand, changing corps boundaries—or moving a corps to another sector—would disrupt the artillery efforts that were so heavily dependent on local experience and close RFC liaison. The attachment of the RFC's artillery-spotting squadrons to corps helped develop teamwork and meant that they too learned a sector, but it also increased the disruption when a corps changed front. <sup>45</sup> (To anticipate developments slightly, on at least one occasion this problem was bypassed by leaving one corps' counter-battery staff in place when the corps was otherwise relieved. <sup>46</sup>) But quiet sectors were not entirely somnolent. There were local attacks and raids, and some armies used some artillery as a 'traveling circus.' Corps were reinforced in rotation, and could exploit German weaknesses. A 'traveling circus' also required a corps to think systematically (to identify those weaknesses) and to plan ahead, and those plans could serve as the basis for larger offensives. Sometimes, as at Vimy Ridge, divisions used their local knowledge and planned ahead for the arrival of a whole corps on their front. <sup>47</sup>

### **1917: The Problems Solved**

On 1 January 1917, counter-battery operations took a step forward. In December 1916, GHQ had recognized that "good organization" was the main contributing factor to counter-battery efficiency. <sup>48</sup> So a Counter-Battery Staff Officer (CBSO)—colloquially the 'counter blaster'—was authorized for each corps "owing to the importance of an efficient counter-battery system, as demonstrated in the SOMME battle." <sup>49</sup> Just as important, he was granted an adequate staff of an orderly officer and clerks, later supplemented by an aide de camp. <sup>50</sup> This was enough for a corps on a quiet sector of the front, but corps engaged in major battles were far busier and scavenged officers from 'resting' corps or subordinate formations. Technically independent of the Commander, Heavy Artillery whose guns he used, the CBSO came directly under the command of the corps artillery commander. There was occasion for prickly officers to stand on protocol, but generally relations were good. <sup>51</sup> The CBSO was not quite an official commander, nor generally used as a staff officer; most corps artillery headquarters were glad to be rid of the heavy burden of counter-battery work, and allotted the CBSO some artillery to perform his black arts. This trend grew through 1917 and 1918. <sup>52</sup> Whether he commanded guns or not, the CBSO was certainly responsible for their employment. <sup>53</sup>

Quite naturally, the Artillery Intelligence office was in constant touch. ([Appendix 40](#) gives a period view of artillery intelligence.) Liaison with the corps' RFC squadron was intimate, with

a CB representative posted at the squadron base. Aerial observation produced about a third of counter-battery information in trench warfare and a much greater amount in mobile operations. Aerial photographs were even more important, providing both the precise information needed for destructive counter-battery fire and the basis for maps. Photos could be processed in as little as six hours, but reliably within twenty-four. Each corps also had [Flash spotting](#) and sound ranging units which provided speedier information that still pinpointed the German guns to between five and twenty-five yards. Flash spotting was quite mobile, needing only a few hours to set up their posts, but sound ranging units needed 36 to 48 hours. Both benefited from more time, which allowed them to improve their communications backwards and sideways (i.e., both to higher headquarters and to each other) and to more accurately survey their locations. Kite Balloons were available in suitable conditions and provided steadier information than aircraft, since they had a longer time aloft and a wider field of view. However, the Germans deployed more long-range guns and drove the balloons further from the front, limiting their utility. When time was critical, CBSOs could give sound ranging or flash spotting units a "direct call" on a battery to speed responses. These batteries, typically heavy howitzers, would have other secondary duties, but if their spotters found a good target they promptly switched to it. Infantry liaison was also a useful source of intelligence, in mobile operations second only to aerial observation.

At the center of an intelligence web, CBSOs could amalgamate information from these varied sources, prioritize it, and order the responses. [54](#) This significantly shortened the decision-making cycle and thus response times. However, this is a somewhat idealized picture; at least one CBSO used a ouija board to select targets. [55](#)

Yet for all his resources and good work, the CBSO was a subordinate executive officer, not really a policy maker. He was given a set amount of resources to accomplish a particular goal. Because the BEF was well aware of the importance of counter-battery work, there were generally adequate resources available, but others allotted the guns and defined the tasks. CBSOs would be consulted about means and ends, but once decisions were reached at higher levels they merely implemented the decisions. CBSOs were sufficiently junior that by the time orders reached them there was nothing to do but obey.

It may be useful to consider a fictitious average day for a counter-battery office. Reports of the previous day's activity, friendly and enemy, are examined in the morning. Friendly action is checked to see if it revealed anything, enemy action checked to see what it divulged. A counter-battery conference is held at the corps' RFC aerodrome, making arrangements for the next few days. The RFC sends up a spotter aircraft, which registers guns on various targets, and another one to observe and correct fire on the targets for the day. Patrol aircraft notice German transport moving, and a zone call is sent down. British guns open fire within five minutes, and the area is marked for future harassing fire. (CBSOs generated intelligence as well as receiving it.) German anti-aircraft guns fired on the British plane, and their location is noted for action tomorrow, when another aircraft will lure them into action, just so British guns can shell them. The returning pilots are debriefed on the runway by the CB liaison officer. Since the wind is from the east, the German guns have to be quiet, or British sound ranging will detect them.

At noon the counter-battery office assembles the daily report of enemy activity, friendly counter-measures, friendly planned fire, intelligence, and other remarks. (It will go to higher headquarters and into the local files, for comparison with several months of data to spot patterns.) The last twenty-four hours have been quiet, although a new German battery has been detected. The battery is assigned a number and marked on the maps with the symbol showing the suspected caliber. German activity yesterday was mainly shelling British infantry; this is not unusual, but is more grist for the intelligence mill. In the afternoon the CBSO goes to the army's fortnightly CB conference. He and his colleagues discuss events and plans, sharing ideas and information. On the whole the Germans have been quiet, but activity is increasing opposite the army's right-hand corps. The MGRA shifts the counter-

battery boundary so the Germans will get a little extra fire for their troubles.

After motoring back to the office, news arrives that a relief is suspected opposite one of the divisions. The CBSO and BGRA arrange night firing to catch the Germans in the open. Since the wind has dropped, they decide to gas any German batteries that fire back. By evening, orders are issued for this mission and tomorrow's ordinary program of firing. ([Appendix 28](#) gives some contemporary views on how a counter-battery office should run.)

The BEF's organization gained an advantage over the Germans, who never adopted the corps as the main level of artillery command, using divisions and armies instead. German divisions were assigned the minimum amount of artillery judged necessary to hold their sector and were reinforced as necessary for offensive or defensive operations. But divisional groups were too small, and there were too many of them. Guns would seldom fire on attacks outside their sector, while a British corps could switch fire to cover threatened areas. The division's artillery staff was also too small; while it certainly built up local knowledge, it was quickly swamped by any amount of reinforcing artillery. Because a division's infantry quickly burned out in combat, the divisions had to be rotated, and while the artillery might not be rotated, the change further undermined continuity of command and good organization. The Germans used army-level artillery control to take up some of the slack; it appears that armies commanded most of the reinforcing heavy guns, as well as some reinforcing field artillery. While the Germans cut a layer out of the command chain, by not having a dedicated counter-battery office they were not living up to their reputation for efficiency and thoroughness.

Besides organization, the British had a significant technical edge in counter-battery work over the Germans. Both sides pressed ahead with technological development, but the British built and maintained an advantage in sound ranging. <sup>56</sup> The Germans never advanced beyond ear-trumpets to determine rough bearings, when British equipment eventually was accurate to twenty-five yards, and even more accurate in good conditions. <sup>57</sup> Some authors credit the Germans with a lead in gun calibration, which they used widely in the 1918 offensives. However, the British had been calibrating their guns for several months before the Battle of Cambrai (that is, before November 1917), and afterwards expanded their calibration facilities, as well as developing a more sophisticated and simpler method. <sup>58</sup> There was no great edge in the aerial battles until the last days of the war. Both sides provided air and balloon squadrons at corps level. The Germans periodically had the upper hand in aircraft technology, but even then the British stoically accepted the casualties and kept their artillery observers flying. Germans adopted and produced more medium caliber guns, thus increasing the average range of their artillery. On balance the British had a small technological edge, but it was not as significant as their organizational edge.

Of course the Germans were not always trying to do the same things that the British were. Defending, they only wanted to disrupt the coordination of British infantry and artillery so that the British infantry would be vulnerable. This did not require such elaborate or centralized control as attacking. If a German division held its ground, it would outflank part of the attacking force and slow the whole attack. It was during long engagements such as the Somme, Arras, or Passchendaele that German CB weaknesses told most. At Passchendaele they had considerable advantages from the terrain, and better handling of their artillery might have made the British offensive untenable. The lack of centralized CB was a liability when the Germans did attack. Even in 1918, their neutralization techniques were not as good as British ones in 1917, nor was their artillery intelligence system as thoroughly developed.

The appointment of CBSOs was just one way that GHQ addressed the whole issue of handling the artillery over the winter of 1916-17. The new policy was a sound one that would last the rest of the war:

Counter-battery work is not a matter of spasmodic effort, but is a continuous operation depending for success on accuracy of fire, continuity of plan, unremitting study and firm control. Its conduct on these lines will alone meet the end in view, namely, the considerable if not total reduction at decisive moments of the volume of hostile artillery fire.... [59](#) (The full text is available as [Appendix 32](#).)

This active policy could still be overruled locally if there was pressing reason. XV Corps planned the coastal operations that were to have formed part of the 1917 Flanders campaign. (Haig wanted not only to attack right along the coast but also to launch a tank-reinforced division in an amphibious hook once the Germans started retreating.) The Germans had the edge both in number of guns and weight of shell. Rawlinson's first step after being given command of the operation was to telephone his MGRA (who was on leave at the time) and begin examining the counter-battery situation. [60](#) After relieving the Belgians, who had held the quiet sector, the British tried their usual active policy. Losses were heavy and results poor; the British were paying heavily and not making any progress. XV Corps then dropped the aggressive policy until the assault was imminent. Instead, they drew up plans outlining many guns would be needed, prepared positions for those reinforcements, and solved all the problems on paper, but they did very little shelling, because there was no point in continuing a failing policy. As it happened, the coastal attack was never made, so the reinforcing guns never arrived, but the plans had been carried out to their logical conclusions. [61](#)

The Arras/Vimy Ridge offensive in April 1917 was the first time CB played a key role in pre-battle plans. The importance of artillery to the German defense was well understood, and consequently there were grave concerns that the Germans would fire a counter-bombardment on the British trenches before Zero Hour that would disrupt the entire attack. [62](#) This was so important that it was one of Birch's main concerns in questioning the Third Army's plans for a surprise attack. Major-General Arthur Holland, senior artilleryman of the Third Army, was confident in his plans, largely because he counted on attacking before the Germans reinforced their artillery. He was also confident of detecting and dealing with reinforcing guns, confident to the point of putting his own head in a noose. In a fit of temper at GHQ's conservatism he offered to stand on a chair in the Grand Place of Arras, the chair to be kicked away when the first German shells interrupted traffic in town. [63](#) GHQ reversed its policy of 1916, when it had assumed initial success and looked to the exploitation. Now they sacrificed *possible* exploitation and *possible* greater success through surprise for a greater certainty of initial success gained by heavy bombardment and counter-battery fire. This change might be because the British effort in spring 1917 was a subsidiary, preliminary attack, with the French slated to provide the breakthrough.

The Third Army's plan was not adopted, but Major-General Herbert Uniacke, senior artilleryman of the Fifth Army, who was temporarily transferred to do the detailed planning after GHQ had intervened and replaced Holland, adopted their methods. Following the updated, post-Somme guidance on attacks, Uniacke and his staff developed a thorough and intelligent plan to deal with the German guns. [64](#) Some artillery were earmarked solely for CB, but it would be reinforced when necessary by guns switched from the bombardment. Counter-battery guns were not switched to the bombardment, so counter-battery fire had some priority over the bombardment. Isolated German batteries were engaged first, and destroyed. Then, nearer Z-Day, concentrated groups of German batteries were shelled, although to a lesser degree because it was harder to destroy larger groups, and those groups had other vulnerabilities. [65](#) Concentrations of guns were prime candidates for neutralization by gas shelling, and their communications and supply routes were heavily shelled.

It made little difference during an attack if the German guns were



destroyed, out of ammunition, or not firing because their phone cables had been cut—the bottom line was that they were not firing. By 1917, the problem of the unlocated German batteries was held to be greater than undestroyed batteries, so tactics changed; one of the advantages to shelling roads was that it kept German batteries in place so the British could shell them at will. Finally, the BEF accepted that some guns would survive no matter how thorough the preliminary counter-battery work. But the survivors would be even less of a threat with their observation posts (OPs) and communications destroyed. So OPs, telephone exchanges, supply dumps, and headquarters were the final bombardment targets in the Arras plans. With all these destroyed, blinded, or interdicted, the German defensive barrage did not hamper the advance. All this was part of an "unprecedented" counter-battery plan, thoroughly integrated into the main preliminary bombardment program, reinforced by bombardment guns switched over from Zero Hour onwards. <sup>66</sup> (The bombardment largely ended at Zero, when the barrage became more important, and the larger howitzers were switched from bombardment duties to counter-battery fire.) So thorough and demanding was the plan that extra officers and clerks had to be drafted in to counter-battery offices. <sup>67</sup>



However, in the later stages of the offensive some of the critical elements so successful during the first few days were lacking. British guns were thinner on the ground, because the mud delayed their advance and the advance of the supply lines, while the Germans could more readily reinforce. Thus fewer guns had to do more work. Also, the BEF needed to bombard again, because it was facing a new defensive line, which drew away the guns that had reinforced the counter-battery effort. But intelligence was the greatest weakness. The Royal Artillery did not know where the German guns were, and so could neither destroy nor neutralize them. <sup>68</sup> Despite the improvements made in the past months, in the later stages of the Arras fighting counter-battery operations resembled those during the Somme.

After the battle some units produced reports on their staff methods. <sup>69</sup> It is not clear who these were for, nor do they seem to have been widely circulated. Curiously, the official reports were unofficially circulated, as Lieutenant Colonel Alan Brooke of Canadian Corps sent the one he had drafted to X Corps, which used it as a guide for planning at Messines. <sup>70</sup>

The attack on the Messines-Wytschaete Ridge was perhaps the acme of destructive CB in 1917. ([Photo Essay 2](#) has some aerial photos of CB at Messines.) The attack's objectives were limited beforehand and stayed that way, unlike at Arras when the limited attack was prolonged to distract the Germans from the failed French offensive in the Champagne. The result was that the BEF had ample artillery to deal with a restricted area. The objectives were also chosen with regard to German gun positions, integrating the two branches in a way rare for more ambitious attacks. <sup>71</sup> Further, both IX Corps and II ANZAC Corps had been in the sector for a considerable time and knew the German gun positions and their patterns of employment. (The Germans would move their guns around among a variety of battery positions to avoid being entirely static and predictable. However, during the months that the British corps were watching, patterns emerged.) Roughly thirty percent of the artillery available were allotted to counter-battery work, which was continuous, methodical, and successful. A new formula was used, with German guns on the main front of attack being neutralized on a one-to-one basis, while those on the flanks were assigned one British per four German guns (the formula required thirty percent of the British artillery). <sup>72</sup> While part of this approach was just for planning convenience, it shows organized thinking that would allow rapid planning. In the future, the number of German guns would only need to be counted and the formula applied to determine the requisite number of British guns. If experience showed these ratios to be either too high or low they could be adjusted, but having guidelines was more productive than the empirical methods used earlier. After the

preliminary counter-battery work by the thirty percent, during the final two days of the preliminary bombardment all medium and heavy artillery was devoted to counter-battery work. Overall, there were a record number of destructive counter-battery missions before Messines, although the record would shortly be bettered during Passchendaele. <sup>73</sup> Flanking corps also provided fire behind the main ridge, and during the assault fired on German guns that could enfilade the attackers, producing a record number of neutralizations on Z Day.

GHQ continued its great emphasis on counter-battery work in this battle, intervening in the Second Army's plans several times. First, they suggested more guns should be used, then checked how they were being used, with Haig himself delving into each corps' plans. Birch also probed the plans and found one corps starting with trench destruction, dedicating only leftovers for CB. He wrote, "This negation of all modern artillery thought appalled me." <sup>74</sup> Birch strove to see that everything was done to protect the infantry from German artillery fire, even going so far as suggesting that the tremendous mines laboriously excavated under Messines Ridge be blown before Zero Hour, simply to simulate the assault and provoke the German guns to fire. Birch bent Haig's ear on the subject and it was up to Plumer to defuse the idea, largely by the proposal that the last two days of the preparatory bombardment be entirely devoted to counter-battery fire. <sup>75</sup> The matter was so important that there was a high-level conference, at which Birch spoke solely as a technical expert. This was an exceptional case, where technical matters had risen to the level of strategy. But it also shows differences between limited attacks and those intended to be decisive. However, Birch had won his point that CB was the main thrust of the bombardment, with only "a sufficiency" of guns assigned to what had been the key element of the previous year's bombardments, trench destruction. <sup>76</sup>

Messines Ridge was a prelude to the Third Battle of Ypres, which did not, however, begin immediately. The detailed plans for Third Ypres took some time to work out, but the day after Messines Ridge was taken the Fifth Army issued preliminary orders stressing the importance of mastering the German artillery. <sup>77</sup> A prolonged bombardment, including the fiercest counter-battery struggle of the war, took several weeks before the way was ready for the infantry. It took so long because the Germans now realized how much they needed to win the counter-battery struggle. They sent considerable artillery reinforcements, replaced their losses, and introduced delaying tactics when they could not gain the upper hand. But either suited them: if their artillery won the struggle, a victory would be excellent, but a delay bought time for German forces to knock Russia out of the war while also getting closer to the rainy season, which would further delay British attacks.



To start with, before the attack the BEF alternated days between counter-battery work and trench bombardment, then the last two days were entirely devoted to counter-battery work. <sup>78</sup> Ammunition expenditure was vast, with II Corps (which was not even in the main attack) firing up to 26,000 rounds per day just for CB; the bombardment and harassing fire were extra. <sup>79</sup> Preliminary firing was again intended to destroy German guns, and then just before the attack their positions were to be drenched in gas. Any batteries still firing at Zero would get even more fire. <sup>80</sup> Over the years, the Germans had had plenty of time to build gun positions reinforced with wood, bricks, or even concrete. There were so many of them that it was hard to tell which were actually occupied; the British had to redefine their criteria for success as destroyed gun-pits, whether they were occupied or not. <sup>81</sup> One innovation was to churn the area around pits, which destroyed ammunition and hampered re-supply, an approach that combined counter-battery and harassing fire. <sup>82</sup>

Despite these handicaps, the physical advantages the Germans had in occupying the high

ground surrounding the Ypres Salient, and the stout efforts by German gunners, the Royal Artillery gradually established fire superiority. By Z-Day, the main German artillery group had lost one-quarter of its field guns and half its heavies, but the Germans just pulled their guns back beyond British range and replaced their losses. <sup>83</sup> The Allied infantry advance then had the effect of putting the infantry in range of the German guns but beyond the range of their own protective artillery fire. Additionally, the attack was poorly conceived, with strategy overruling operational and tactical considerations, and pressed too far.

Regardless of its strategic location, the Ypres Salient was not a good place to attack. While Haig deserves blame for insisting on an attack there, it is harder to decide what the British (and Allied) strategy should have been. The Germans would certainly have appreciated a relaxation of Allied assaults on the Western Front, while an intensification of Allied efforts in Palestine, Salonika, or Italy would not have had as much effect on Germany. Moreover, a passive Allied posture would not have suited their political or diplomatic goals, either domestically or vis-à-vis the United States. Regardless of these considerations, the BEF attacked around Ypres and had to face conditions there.

Despite mixed opening success on 31 July (which was greatest where it was least important), GHQ continued to press the offensive and CB grew in importance. The fixed defenses were gradually shattered, which left the Germans with only artillery fire and infantry counter-attacks to help hold their ground (the weather helped, but from the German point of view was never bad enough). <sup>84</sup> The BEF acted flexibly, adding bombardment artillery to counter-battery tasks or switching artillery from counter-battery tasks and using it for a protective barrage when that was more important. The artillery was still available for CB, but there was no point in continuing neutralization on dazed targets. <sup>85</sup> This flexibility shows that Birch and GHQ were not monomaniacs for CB, but were adjusting artillery fire to offer the best possible support of the infantry. Because of the prolonged fighting, destructive CB naturally took on a higher profile than neutralization, and at times was allotted half of all the artillery in the Salient. It was carefully co-ordinated with the rest of the artillery fire, and an elaborate variety of deceptive measures were taken. Creeping barrages were fired exactly as they would be to cover an attack, and when German artillery fired its defensive barrages, British counter-battery staffs noted new targets. <sup>86</sup> These could be engaged either immediately or at a more important time in the future. Attack frontages were disguised by expanding CB beyond the attack sector, which also helped to limit German enfilade fire and to prepare the way for future attacks. <sup>87</sup>

Several times during the battle the Germans changed their tactics, but alert and intelligent British staff officers and commanders soon caught up, and at times even anticipated German changes. <sup>88</sup> But in the end the counter-battery contest was decided as much by weight of fire as by how cleverly it was applied. As long as the weather held fair, ammunition and guns could advance and support attacks. <sup>89</sup> When the rains came, supply fell off, progress slackened, and casualties mounted.

The subordination of tactics to strategy is borne out by the choice of Flanders as the theater of action. Theoretically, Flanders probably was the right place to attack (not only did it threaten German submarine bases, but taking one rail junction would force a German withdrawal on a very substantial front, roughly forty miles), but not enough attention was paid to details. No breakthrough had succeeded, no attack had been possible without substantial artillery superiority, and mud had the power to cancel most advances. Flanders would simply reinforce these lessons. Artillerymen did what they could to ease the burden on the infantry, but they could not do everything. Several times the gunners' exhaustion threatened the advance, because while the infantry were rotated through Flanders, there was not sufficient artillery (especially heavy artillery) for adequate rest. When the matter was raised with Haig, he acknowledged the problem but insisted that the offensive continue

because the strategy was right.

In contrast to the immense, bludgeoning counter-battery effort at Third Ypres, the next British attack was with a rapier. The Battle of Cambrai saw an entirely different emphasis, made possible by the presence of tanks. These dealt with the German barbed wire, permitting a surprise attack. <sup>90</sup> Surprise meant that the Germans would not have infantry or artillery reinforcements in place, and that meant no preliminary bombardment was necessary. The counter-battery effort could be devoted entirely to neutralizing the German guns—there were only 34 facing the main assault, showing the benefits surprise could offer—and only until friendly troops got close enough to attack those guns directly. The Royal Artillery also implemented new methods for accurate shooting (predicted fire), but also made the most of thorough planning. Of the 1,003 guns available, two-thirds would be devoted to CB, a ratio that became standard for British surprise attacks. As before, the German guns would not be the sole target for neutralization. Observation posts would be blinded with smoke screens, while headquarters and telephone exchanges were shelled to disrupt command and communications. <sup>91</sup> German batteries received a mix of HE and gas calculated to reduce their efficiency if they fired at all. Special provision was made for German anti-tank guns: once spotted (either from the ground or by special RFC patrols), they would be shelled for five minutes. <sup>92</sup>

After an excellent break-in progress slowed, and the success of the German counter-attack on 30 November was largely due to bad British counter-battery intelligence. Poor weather had kept the RFC from flying, while sound ranging and flash spotting networks had yet to be established on the captured ground. <sup>93</sup> Counter-battery intelligence was a key part of British defensive intelligence, because the Germans had to muster a large number of guns to attack; the lack of counter-battery intelligence heightened the overall German surprise. While the BEF held little new ground at the end of the battle, the net results of the battle were good from the artillery perspective. The major new concept—predicted fire—had been proven and would become the norm in 1918. Secrecy had been preserved, and the same steps could be repeated while some aspects that were wanting (such as too-short smoke barrages) could be improved. <sup>94</sup>

Again in 1917 there was progress in counter-battery work in the quiet sectors of the British front, but it was less marked since the basic methods had been decided and a framework established. Even in the midst of major battles, daily and weekly reports were produced, and in fact they were even more important during rapidly changing situations. Armies and GHQ paid ever more attention to counter-battery performance as it became clear how vital it was for victories. Yet attention was seldom interference, especially as the corps staffs became more proficient and proved themselves. Instead of being forced to deal with distracting visits by generals, front-line soldiers found that their experience was solicited and distributed in a stream of informational pamphlets. On the other hand, by 1917 many units had their own way of doing things and may have given scant attention to official methods. One important way expertise was shared was by loaning officers. Often corps at rest would send their staff officers to other corps engaged in battle to help with the extra work. <sup>95</sup> In addition, courses were available for staff officers, and there was often a rotation of junior officers from brigades to corps headquarters to keep both fresh. <sup>96</sup>

There were two main areas where information still came from the top down: gas warfare and new technologies. With new kinds of gas constantly being introduced, there was a stream of pamphlets on its use, which was reasonable since frontline troops lacked any experience with the new gasses. <sup>97</sup> Information included how many shells were necessary to cover a given area and various tactical schemes to maximize effectiveness. The 1918 editions had more vicious, more cunning, more effective tactical ideas, which were clearly the product of experience. <sup>98</sup> Smoke shells were also new, their use also needed to be

explained. A variety of pamphlets dealt purely with smoke shells, while others discussed how smoke would affect tactical questions. [99](#)

The technical aspects of gunnery had to be taught not only to the New Armies and Territorial gunners but also to many 'horsey' artillerymen who had disdained it before the war. While basic standards were rising, new methods were constantly being introduced (the most important of which were calibration and survey), and this constantly raised the bar. These were the keys to surprise at Cambrai, and it was realized that surprise and its benefits could be repeated only if units were properly trained. New tactical methods appeared, like the "one round shoot," in which artillery in range fired one round timed to arrive simultaneously on a given target. Either a brigade would fire, or all corps artillery might fire. [100](#) This was a model of efficient communications and staff work, and could be devastatingly effective. [101](#) It is noteworthy that the concerns for Cambrai had centered on the predicted barrage, rather than on predicted counter-battery work, which had already been proven in the quiet sectors.

### **1918: Maturation of the System**

Although the BEF switched over the winter of 1917-18 to a general defensive posture, this had little effect on counter-battery work. [102](#) Counter-battery fire still had a high priority; indeed, periodic heavy counter-battery shoots, trench bombardments, and raids were the BEF's only aggressive activities. The lack of change was silent acknowledgment that the system of Counter Battery Staff Officers was working. [103](#) But counter-battery fire still fit into an overall combat framework, and its importance could be downgraded. On those sectors of the front with poorly developed defenses (and where British working parties would be exposed to German fire), the decision was made not to try to dominate the Germans through intense counter-battery fire but instead to slacken all British fire and accept a live-and-let-live status quo. [104](#) This was a decision for formation commanders, and they could make it knowing what results the artillery would produce through aggressive counter-battery fire and weigh that against other considerations.

Thinly held areas, like that of the Fifth Army along the Somme, were even more reliant upon their artillery than the more heavily manned areas near Ypres and Arras; artillery provided a bigger percentage of the Fifth Army's firepower. [105](#) However, the Fifth Army had a problem beyond the paucity of troops, namely that the French had left the trenches in poor shape, so even the aggressive Hubert Gough adopted a live-and-let-live policy. [106](#) ([Appendix 30](#) has the Fifth Army's policy guidelines.) This prevented any firing at all until the Germans realized that the British had replaced the French. Even once the Germans realized the change, the Fifth Army kept a relatively low profile. It did plan to begin widespread and intensive counter-battery work as soon as any German offensive preparations were detected, but by that point the Fifth Army lacked the artillery strength to make much difference.

In ordinary trench warfare, CBSOs collected data and evaluated it for their own purposes. Under these new conditions, they were intelligence producers for the BEF as a whole. Since the Germans held the initiative, guessing German intentions was vital, and CBSOs produced useful material about German artillery deployment. If German guns fired mainly from distant positions and harassed British communications, it indicated defensive intentions, or maybe a withdrawal. German shelling of roads in British lines, building alternate positions in greater depth, and not repairing inadvertent damage to their own roads were other signs of defensive intentions. But if more guns arrived, roads and bridges were repaired, or guns were deployed forward, it indicated an impending attack. In addition, two other activities provided important intelligence. The Germans never developed the knack of maintaining a constant rate of artillery activity. Before an attack, their firing first rose as batteries familiarized themselves with an area; then, as orders to restrain activity took effect, the rate of fire fell. Nor did the Germans entirely trust calibration behind the lines, and as a result

they almost always fired a few ranging shots. These patterns of German behavior meant that CBSOs had a great deal of useful information about German artillery, and thus about German intentions on a given front. This, together with the high profile of CB in ordinary trench warfare, meant that CBSOs gained responsibility during the winter of 1917-18.

When the Germans attacked on 21 March the BEF's elaborate counter-battery infrastructure collapsed. Wire-based communications failed, the Royal Flying Corps was driven back, sound ranging and flash spotting networks were disrupted, headquarters had to displace and thus lost contact, and the Royal Artillery had more important targets. Heavy artillery was soon captured, evacuated from the area of operations, or dispersed among the infantry divisions. Regardless of what happened to the guns, counter-battery work regressed to firing at observed German batteries. Poor RFC liaison was perhaps the most significant failing, since it deprived headquarters of information. Although those artillery brigades that had wireless sets could have worked with aerial spotters, the headquarters could not organize the cooperative effort because their communications nets were ruined. [107](#)

The April offensive around Ypres and the Lys saw much the same situation. With the front no longer static, the Royal Artillery had to use different methods. Heavy guns were parceled out to divisions, ending any chance for more integrated artillery use on counter-battery fire or any other mission. Yet, while centralized control was theoretically best, the infantry desperately needed some support, and the decentralized artillery provided that. [108](#)

Moreover, the weakened communications networks generally made centralized control impossible. Some formations, like XV Corps, firmly resisted dispersion. They found concentrated counter-battery and counter-preparation fire far more effective when using the whole corps' resources than with just a division's reinforced artillery. [109](#) Still, these formations could stay centralized only as long as their front held, because once they had to move, the communications networks that permitted concentrated fire from dispersed guns failed. Both policies had points in their favor, and retaining guns under corps control was preferable but was clearly not always possible. Once the action became mobile, it was "disastrous" to rely upon central control: orders would arrive late (if at all), and direct fire again came into play. [110](#)

The objectives for CB also needed re-evaluation. In trench warfare, the policy was to neutralize all active German guns, then destroy as many as the British shell supply allowed. [111](#) During its own surprise attacks the BEF emphasized neutralization, counting on capturing the guns later. But neutralization did not work with the BEF on the defensive. German artillerymen stuck to their guns, inspired by their part in the supposedly war-winning offensives, and the Germans had such a preponderance of guns that they could accept a few firing at a reduced rate. In response, GHQ rapidly changed policies across the BEF. Now, rather than seeking to slow the whole attack, overwhelming fire was concentrated in a few sectors. [112](#) This was destructive fire being deployed in defense, a move that ran against all tradition and experience and one that could only be made with a highly centralized command structure.

Even when the weight of German attacks was switched from the British to the French sector, this remained the major defensive policy. Counter-battery fire was to be continuous, with the usual trench-warfare goal of destroying as many German guns as possible. Yet there could only be an artillery duel when there were no more important targets, i.e., when the infantry did not need immediate support. If a German assault was expected, concentrations were fired on narrow sectors, again to destroy guns and especially artillery personnel. While the British policy might not destroy a high percentage of German guns, it might disorganize the attack by weakening a sector, and that weakness would then ripple through the rest of the attack. The decentralized German infiltration tactics were intended to minimize this sort of problem but could not make it go away. This policy characterized the lull between the halt of German attacks in May and the resumption of major Allied attacks in

August. [113](#)

The British front did not stagnate during the lull. Local attacks pushed the Germans out of important positions, and raids kept things lively. The small operations fit well with the new counter-battery policy, and when something bigger was attempted the only requirement was more guns. Surprise, as at Cambrai, was a precondition for several such attacks, and that made CB a high priority, because in a surprise attack the German artillery formed such a significant part of their defensive firepower. For example, at Hamel on 4 July two-thirds of heavy artillery was used for counter-battery work, and (to safeguard surprise) none of it had been allowed to register. [114](#)

The Battle of Amiens (8-14 August) opened the series of connected Allied offensives that broke the German Army and led to the Armistice. CB was handled in a manner nearly identically to Cambrai, although there was more concern about German counter-preparation, a barrage fired on the assembled attackers even before they attacked. The British artillery that moved into the Amiens sector was kept silent until the last night, and even then it could only fire if the Germans fired counter-preparation. [115](#) Interestingly, this decision was delegated to the CBSO, an acknowledgment of his growing role as a commander, one with crucial but limited responsibilities, but also the man with the right information. [116](#)

The counter-battery results were impressive: some German batteries were found abandoned with muzzle-caps still in place after the gunners fled, while others were found abandoned with all their horses killed as they tried to move. [117](#) The British infantry took few casualties from German shellfire as they advanced because the German artillery had largely been taken out of action. [118](#) During the day, many opportunity targets were engaged, with ordinary German batteries and anti-tank (AT) guns the highest priorities. The advance continued, although within 48 hours counter-battery fire had become much less effective since intelligence and communications (especially by wire) had deteriorated. There were cases where the corps headquarters were better informed than their subordinates closer to the action because the corps received information from a wider range of sources (including the Royal Air Force), while a brigade would only know what information the runners could bring to it. [119](#) Most counter-battery shoots for the rest of the battle were zone-calls (a few batteries responding to a newly detected target in their sector), which were obviously less satisfactory since fewer guns would fire and there was little chance of knocking out any German guns. [120](#) German batteries might not be spotted, and if they were they might have done their damage before the British artillery could respond.



Some of these aspects were repeated in later actions, although the use of tanks (a key point at Amiens) in the attack was less common. Precisely because tanks were rare, great care was paid to suppressing the German anti-tank guns. Aeroplanes were assigned specifically to search for AT guns, each with a 60-pounder battery waiting so the AT gun could be engaged immediately and overwhelmingly. [121](#)

Counter-battery fire was effective at the opening of an attack, but as co-ordination declined on succeeding days, the infantry found it harder and harder to gain ground. The British infantry really only needed the German artillery to be suppressed long enough to allow a break-in; thereafter they could work themselves forward through the German infantry, whose morale was crumbling. [122](#) Typically, 50-70 percent of the available heavy artillery was under the control of the CBSO, with only a minority bombarding to more directly support the infantry. But the CBSO was becoming more of an all-round artillery commander. Although his first task during an attack was counter-battery fire, the CBSO also controlled the fire for interdicting German communications, especially with reinforcing or retreating troops. [123](#)

This was the peak of responsibility for CBSOs, who now generally had autonomy over counter-battery fire and the bulk of harassing fire. <sup>124</sup> In mobile operations, it was generally impossible to get sound ranging or flash spotting units into action, which increased dependence on the RAF (the RFC's name was changed in April 1918). Zone calls became the main source of artillery information when the Germans were not in prepared positions, and the Royal Artillery benefited greatly from the rapid decline of German air power. Still, mobile operations meant greater decentralization (even corps headquarters could not keep up), and frequently less-experienced divisional officers had to manage counter-battery work themselves. <sup>125</sup> They lacked the experience of specialist counter-battery personnel, as well as the full range of intelligence sources that fed into the corps. Eventually the plan was to train one officer per heavy artillery brigade in counter-battery operation, but the Armistice rendered the point moot. <sup>126</sup>

In contrast to more mobile operations, when the Germans held strong positions like the Hindenburg Line, they had to be ejected with a properly supported attack. Full bombardment plans were developed, often on very short notice, and fired by guns that moved straight into their firing positions from the line of march. <sup>127</sup> Despite these time pressures, the latest procedures were used, survey and resection being possible in not much more than 40 hours. <sup>128</sup> Counter-battery operations were now cut-and-dried. The first step was to isolate German guns from resupply of ammunition by cratering the road and tracks; this also made withdrawing the guns difficult and increased the number of guns the British infantry captured—guns that would not be available for the next battle. Step two was destructive fire on the pinned German batteries. After Zero Hour, any surviving guns would be neutralized. <sup>129</sup> Showing their close interrelation, the interdiction and harassing fire program was often as detailed as the counter-battery program. Bombardments like this gave the BEF fresh impetus, and divisions could again advance with much less artillery, at least until the Germans organized another strong position. Whenever the British advance faltered, corps control of artillery was rapidly and smoothly reasserted, bringing up more artillery and staff officers, along with the intelligence resources they controlled. All this would provide the impetus to get through the next German line—if enough supplies could be pushed up. When supplies ran low, formations shifted to concentrated harassing fire, which could also be destructive in its effects. When the Third Army was "almost stationary" after 26 October it organized aggressive counter-battery and harassing fire, supported by the full panoply of RAF, balloons, sound ranging, and flash spotting. When the Second Army had to pause at the Scheldt, it only advanced enough guns for protection against German counter-attacks and to conduct destructive counter-battery fire. <sup>130</sup>

## Conclusion

Counter-battery fire rose from being a low-priority, haphazard part of artillery tactics to an organized and integrated element of the battle plan. In the early days, counter-battery fire was neglected because it was less important than other missions. Once the Germans changed their defensive tactics and emphasized artillery fire, the value of good counter-battery fire became clear, but effective means were lacking. The most that was possible was a brief flurry of shells to encourage the Germans to cease their fire. The Germans could avoid the British counter-battery efforts by withdrawing their guns out of sight of the British front line. From then on, the BEF sought destruction of German artillery rather than its neutralization, but it was generally not possible in the early days. Faltering attempts were hampered by technical deficiencies, but these were gradually overcome by the end of 1916. The final missing link was a co-coordinator of all the information. The appointment of Counter Battery Staff Officers was the key step, although there had been officers in charge of counter-battery fire before. The difference was that now counter-battery fire had the full-time attention it needed, and extra planning help was made available to corps in the middle of large battles. Over time, as CBSOs gained experience with the Germans in their sectors, they were gradually given command of guns until at times in 1918 they rivaled the

Commander, Heavy Artillery for control of heavy artillery.

Although having friendly artillery fire directed at enemy artillery is intuitively a purely artillery matter, counter-battery fire involved virtually the whole of the BEF. The artillery needed help (especially from the Royal Engineers and RFC/RAF) to do its best, and it never lost sight of the fact that this 'gun duel' was to help the attacking infantry. When those attackers needed German guns shelled, that was a top priority; when something else was more important, artillery turned to the new concerns. Artillerymen used every wile to get the best results, but never abused the quasi-independence of counter-battery activities to pursue their own ends.

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**Notes:**

**Note 1:** FSR 1909, §106, ¶15; *FAT 1914*, §223. [Back.](#)

**Note 2:** Rawlins, *History*, 250. [Back.](#)

**Note 3:** FSR 1909, 133. [Back.](#)

**Note 4:** *FAT 1914*, 347, 276. [Back.](#)

**Note 5:** John Terraine, *Mons: Retreat to Victory* (London: Batsford, 1960), 147. [Back.](#)

**Note 6:** *OH 1914*, vol. 1, 434-6. [Back.](#)

**Note 7:** *Ibid.*, 419; Haig Diary, 16 September and 4 October 1914. [Back.](#)

**Note 8:** *OH 1914*, vol. 1, 134, n. 6. [Back.](#)

**Note 9:** *OH 1914*, vol. 2, 81, 82, 83, 106. [Back.](#)

**Note 10:** Smith-Dorrien to GHQ, 4 November 1914, WO95/654. [Back.](#)

**Note 11:** CDS2, "Notes from the Front," November 1914. [Back.](#)

**Note 12:** *OH 1914*, vol. 2, 165. [Back.](#)

**Note 13:** Nicholson, *Gunners of Canada: The History of the Royal Regiment of Canadian Artillery* vol. I, 1534-1919, (Toronto: McClelland and Stewart, 1967), 222, 244, 240. [Back.](#)

**Note 14:** See A. F. Becke, *Order of Battle of Divisions four volumes* (London: HMSO, 1935-45); most Territorial Force divisions—those of the first three New Armies—had this happen. [Back.](#)

**Note 15:** *OH 1915*, vol. 1, 86-7. [Back.](#)

**Note 16:** There was a brief period of being called Reserve Heavy Artillery, but that acronym already belonged to the Royal Horse Artillery. [Back.](#)

**Note 17:** *OH 1915*, vol. 1, 313. [Back.](#)

**Note 18:** J. B. A. Bailey, *Field Artillery and Firepower* (Oxford: Military Press, 1989), 62, note 61. [Back.](#)

**Note 19:** R. C. de Winton to Edmonds, CAB45/141. [Back.](#)

**Note 20:** V Corps CHA diary (WO95/757), 2 March 1916; No. 1 HARG diary (WO95/86), 13

April 1915; No. 2 HARG diary (WO95/87), 9-10 May 1915. [Back.](#)

**Note 21:** No. 1 HARG diary (WO95/86), 9-10 March 1915. [Back.](#)

**Note 22:** Ibid., 12 March 1915. [Back.](#)

**Note 23:** Ibid., 9 March 1915. [Back.](#)

**Note 24:** Ibid., 24 March 1915. [Back.](#)

**Note 25:** I Corps BGRA diary (WO95/619), 27 September 1915. [Back.](#)

**Note 26:** No. 1 HARG diary (WO95/86), 10 May 1915 and 14 June 1915. [Back.](#)

**Note 27:** IV Corps BGRA diary (WO95/728), 2-26 September 1915. This may have been a local problem with the chain of command; see Chapter 9. [Back.](#)

**Note 28:** Rawlins, *History*, 105; III Corps BGRA diary (WO95/689), 22 November 1915. [Back.](#)

**Note 29:** Farndale, *History of the Royal Regiment of Artillery, Western Front 1914-18*, 122. [Back.](#)

**Note 30:** *OH 1915*, vol. 2, 306, 376. [Back.](#)

**Note 31:** II Corps BGRA diary (WO95/651), 25 April 1916, 26 July 1916. [Back.](#)

**Note 32:** III Corps BGRA diary (WO95/690), 28 June 1916. [Back.](#)

**Note 33:** V Corps BGRA diary (WO95/756), 2 September 1916. [Back.](#)

**Note 34:** X Corps CHA diary (WO95/862), c. 18 June 1916; XIII Corps BGRA diary (WO95/901), 23 June 1916; VII Corps BGRA diary (WO95/811), 13 June 1916. [Back.](#)

**Note 35:** III Corps BGRA diary (WO95/690), 12 August 1916. [Back.](#)

**Note 36:** II Corps BGRA diary (WO95/651), August and October 1916. [Back.](#)

**Note 37:** *OH 1916*, vol. 2, 171. [Back.](#)

**Note 38:** I ANZAC Corps upheld the Australian reputation for not suffering paperwork gladly: WO95/992. See II Corps BGRA diary (WO95/651), July 1916 for an indication of the changes Uniacke forced. [Back.](#)

**Note 39:** Rawlins, *History*, 108. [Back.](#)

**Note 40:** CB remained a high priority for tanks: SS164, "Notes on the use of tanks...", May 1917. [Back.](#)

**Note 41:** No. 2 HARG diary (WO95/87), 14 or 16 June 1915. [Back.](#)

**Note 42:** Probably the best book on the subject is P. Chasseaud, *Topography of Armageddon: A British trench map atlas of the Western Front, 1914-1918* (London: Mapbooks, 1991). [Back.](#)

**Note 43:** After the war, the Royal Artillery took over survey responsibility from the Royal Engineers. [Back.](#)

**Note 44:** X Corps BGRA diary (WO95/863), 28 September 1917. [Back.](#)

**Note 45:** II Corps CHA diary (WO95/654), September 1916. [Back.](#)

**Note 46:** XVIII Corps diary (WO95/955), October 1917. [Back.](#)

**Note 47:** Bailey, *Field Artillery*, 139 note 28. [Back.](#)

**Note 48:** SS131, "Co-operation of Aircraft with Artillery," December 1916 edition. [Back.](#)

**Note 49:** OB/1911 of 17 December 1916. Technically CBSO was just the common term, and the official term was "Lt. Col., RA, attached for Counter Battery Work": RA Nomenclature Committee, Horne Papers, IWM. Albert P. Palazzo, in "The British Army's Counter-Battery Staff Office and Control of the Enemy in World War I," *Journal of Military History* 63:1 (January 1999): 55-74, comes to much the same conclusions, especially about the importance of the permanent CBSO organization. [Back.](#)

**Note 50:** Circular 121/Staff/4903 of 25 February 1918. "Artillery Experiences in Messines Battle, IX Corps." (WO95/841) [Back.](#)

**Note 51:** Canadian Corps changed this arrangement practically but not officially in 1918, with the CBSO coming under the CHA. The modified system was adopted by the British after the war and lasted through WWII. Nicholson, *Gunners of Canada*, 367. [Back.](#)

**Note 52:** Canadian Corps probably pioneered this development; "Notes on Counter Battery Work in connection with the Capture of the Vimy Ridge by the Canadian Corps on April 9th 1917," WO/95/1059, ¶4 (hereafter, "Canadian CB at Vimy"). Lt. Col. A. F. Brooke was a staff officer to the GOCRA Canadian Corps from the end of 1916 until the Armistice. [Back.](#)

**Note 53:** A. G. L. McNaughton "Counter Battery Work," *Canadian Defence Quarterly* 3:4 (1926): 15, from which this section largely draws. McNaughton was first CBSO and then CHA of Canadian Corps. After becoming CHA he kept much CB authority during mobile operations, but in trench warfare he left it to the CBSO, Major H. D. G. Crerar. [Back.](#)

**Note 54:** Rawlins, *History*, 19-20; Bailey, *Field Artillery*, 62 and note 62. [Back.](#)

**Note 55:** H. H. Hemming Papers, IWM. [Back.](#)

**Note 56:** SS580, "... what can be done by our Batteries to avoid detection by enemy Sound Ranging," 14 September 1917, shows the differences between British and German technology. [Back.](#)

**Note 57:** In an example of lateral thinking, inspiration came to a British scientist in the latrine. A rent in the canvas let a cold blast of air onto exposed flesh, showing him that the flight of the shell could be detected, not just the sound of discharge. See Sir Lawrence Bragg, A. H. Dowson, and H. H. Hemming, *Artillery Survey in the First World War* (London: Field Survey Association, 1971). Daniel J. Kevles, "Flash and Sound in the AEF: The History of a Technical Service," *Military Affairs* 33:3 (December 1969): 374-84, discusses the relative merits of British and French sound-ranging equipment, and leans towards the British equipment. [Back.](#)

**Note 58:** III Corps BGRA diary (WO95/692), 29 June 1917; II ANZAC Corps CHA diary (WO95/1034), section on Loring's Group, late December 1916 or early January 1917; Canadian Corps GOCRA diary (WO95/1059), August 1918. [Back.](#)

**Note 59:** SS139/3, January 1917. [Back.](#)

**Note 60:** Rawlinson Diary, 25 May 1917. [Back.](#)

**Note 61:** XV Corps diary (WO95/925), August-September 1917. [Back.](#)

**Note 62:** *OH 1917*, vol. 1, 201-2. [Back.](#)

**Note 63:** Allenby Papers, LHC, 6/VII/7. [Back.](#)

**Note 64:** See SS135, "Instructions for the Training of Divisions for Offensive Action," (December 1916), which discussed bombardment, barrages, and CB. [Back.](#)

**Note 65:** *OH 1917*, vol. 1, 313. [Back.](#)

**Note 66:** *OH 1917*, vol. 1, 312. See also *OH 1917* Appendices, 44-51, 52-8. [Back.](#)

**Note 67:** Rawlins, *History*, 117-9; "Canadian CB at Vimy," ¶6. [Back.](#)

**Note 68:** Even when batteries were firing in view of British infantry, liaison could fail. *OH 1917*, vol. 1, 382. [Back.](#)

**Note 69:** "Canadian CB at Vimy" is one very thorough example. [Back.](#)

**Note 70:** H. W. Wynter, "The Revival of the Barrage," *JRA* 70:4 (1943): 272. Wynter was then with X Corps. [Back.](#)

**Note 71:** Rawlins, *History*, 124. [Back.](#)

**Note 72:** X Corps BGRA diary (WO95/864), April 1917; GHQ took direct interest in overseeing counterbattery fire on the flanks; see Rawlins, *History*, 126. [Back.](#)

**Note 73:** Rawlins, *History*, 131. [Back.](#)

**Note 74:** Haig Diary, 26 May 1917-4 June 1917; Birch quoted in Anstey galley proofs, 193. [Back.](#)

**Note 75:** GHQ to Second Army, 29 May 1917, and conference 30 May 1917, WO158/215. [Back.](#)

**Note 76:** Birch to Harington, 16 May 1917, in Anstey Papers. [Back.](#)

**Note 77:** Anstey proofs, 135. [Back.](#)

**Note 78:** *OH 1917*, vol. 2, 43, 47. [Back.](#)

**Note 79:** This is heavy artillery ammunition; field guns would be firing still more. II Corps CHA diary (WO95/656), August 1917. [Back.](#)

**Note 80:** *OH 1917*, vol. 2, 49 and note 1. [Back.](#)

**Note 81:** *OH 1917*, vol. 2, 136. [Back.](#)

**Note 82:** Rawlins, *History*, 135; I ANZAC Corps BGRA diary (WO95/994), 11 September 1917. [Back.](#)

**Note 83:** *OH 1917*, vol. 2, 93; 138, note 1. [Back.](#)

**Note 84:** *Ibid.*, 300-1. [Back.](#)

**Note 85:** CB was still the main priority until Z+15, when the infantry were at their most vulnerable. Bailey, *Field Artillery*, 140, note 32; Rawlins, *History*, 128 [Back.](#)

**Note 86:** X Corps BGRA diary (WO95/864), 3 September 1917. [Back.](#)

**Note 87:** *OH 1917*, vol. 2, 184. [Back.](#)

**Note 88:** Rawlins, *History*, 146-50. [Back.](#)

**Note 89:** *OH 1917*, vol. 2, 348, note 1. [Back.](#)

**Note 90:** *OH 1917*, vol. 3, 10-12. [Back.](#)

**Note 91:** *OH 1917*, vol. 3, 326-27. [Back.](#)

**Note 92:** IV Corps BGRA diary (WO95/729), 18 November 1917. [Back.](#)

**Note 93:** *OH 1917*, vol. 3, 332. [Back.](#)

**Note 94:** *Ibid.*, 286-7, 333. [Back.](#)

**Note 95:** IV Corps noted in November 1916, "Staff on loan to HA 2nd Corps. HQHA 4th Corps still theoretically resting...", and II ANZAC helped I ANZAC in September 1917. WO95/728 and WO95/994. [Back.](#)

**Note 96:** This was true even for experienced officers. XV Corps BGRA diary (WO95/925), 7 February 1918. [Back.](#)

**Note 97:** E.g., SS158, "... Recent Operations on the Front of First, Third, Fourth and Fifth Armies," May and July 1917. [Back.](#)

**Note 98:** See SS134, "... the use of Lethal and Lachrymatory Shells and Bombs," December 1916, August (?) 1917, and March 1918. [Back.](#)

**Note 99:** E.g., SS175, "... the use of Smoke"; SS214, "Tanks and their employment..."; SS135 "The Division in Attack" (January and November 1918 eds.). [Back.](#)

**Note 100:** XVII Corps BGRA diary (WO95/955), August 1917. [Back.](#)

**Note 101:** On occasion it was actually over-used: I Corps BGRA diary (WO95/619), June and July 1917. [Back.](#)

**Note 102:** See Bailey, *Field Artillery*, 145-8. [Back.](#)

**Note 103:** SS131, revised edition, December 1917. [Back.](#)

**Note 104:** E.g. ANZAC Corps BGRA diary (WO95/995), 3 February 1918. [Back.](#)

**Note 105:** *OH 1918*, vol. 1, 125. [Back.](#)

**Note 106:** III Corps BGRA diary (WO95/694), 26 January 1918. [Back.](#)

**Note 107:** See "Notes on Recent Fighting No.5 - Artillery" (April 1918). CBSOs were urged to stay with corps headquarters, since they should be located near the aerodromes. [Back.](#)

**Note 108:** *OH 1918*, vol. 2, 95. [Back.](#)

**Note 109:** XV Corps BGRA diary (WO95/925), 16 April 1918. [Back.](#)

**Note 110:** *OH 1918*, vol. 2, 293, 521, 523-4. [Back.](#)

**Note 111:** This was the general policy adopted after the war. R. W. MacLeod, "Some Notes on Counter-Battery Work with Divisional Artillery," *JRA* 63:1 (1936): 12-32. [Back.](#)

**Note 112:** XIII Corps BGRA diary (WO95/902), 20 July 1918. [Back.](#)

**Note 113:** V Corps BGRA diary (WO95/756), 12 July 1918; XIX Corps BGRA diary (WO95/968), 29 June 1918. [Back.](#)

**Note 114:** SS218, "Operations by the Australian Corps against Hamel ...," July 1918. [Back.](#)

**Note 115:** *OH 1918*, vol. 4, 17, 23. [Back.](#)

**Note 116:** *Ibid.*, 26-7. This may have been peculiar to the Canadian Corps, who called their senior gunner GOCRA, and the CBSO was instead the Counter-Battery Officer. After the war, CBO became standard nomenclature. Nicholson, *Gunners of Canada*, 242, 367; Anon., "The Organization of Counter-Battery Work in Mobile Warfare by a Medium Brigade Allotted to a Division," *JRA* 63:2 (1936): 171-6. [Back.](#)

**Note 117:** *OH 1918*, vol. 4, 47. [Back.](#)

**Note 118:** Director of Medical Services, Fourth Army, quoted in Rawlins, *History*, 220. [Back.](#)

**Note 119:** Canadian Corps GOCRA diary (WO95/1060), 14 August 1918. [Back.](#)

**Note 120:** *OH 1918*, vol. 4, 129. [Back.](#)

**Note 121:** IV Corps BGRA diary (WO95/730), 19 August 1918. [Back.](#)

**Note 122:** *OH 1918*, vol. 4, 184, 222; *OH 1918*, vol. 5, 33. [Back.](#)

**Note 123:** *OH 1918*, vol. 4, 264. [Back.](#)

**Note 124:** Canadian Corps delegated even more. As attack turned into exploitation, some RGA was devolved from corps to divisions, but if more help was needed the CBO was responsible. *OH 1918*, vol. 5, 636-7. [Back.](#)

**Note 125:** Rawlins, *History*, 224-5. [Back.](#)

**Note 126:** *Ibid.*, 244. [Back.](#)

**Note 127:** *OH 1918*, vol. 4, 477, 490. [Back.](#)

**Note 128:** *OH 1918*, vol. 4, 335. [Back.](#)

**Note 129:** Mustard gas was particularly effective at interdicting German movement, as their gas defenses were worse than British ones. It was first available for the breaking of the Hindenburg Line. [Back.](#)

**Note 130:** *OH 1918*, vol. 5, 391-2, 450. [Back.](#)

["The Infantry cannot do with a gun less": The Place of the Artillery  
in the British Expeditionary Force, 1914-1918](#)