



2. Background through the end of 1914

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Introduction

The fifteen years before the outbreak of World War I saw a greater revolution in artillery than in the previous century, perhaps even the previous two centuries. The guns themselves changed and so did their use. But the people behind them changed more slowly, making piecemeal changes and only making those when forced to. There was an interesting mix in the British artillery forces of progressives and conservatives, and even some modernizing reactionaries. While artillerymen received new guns, they were not issued brand new ideas.

The Legacy of the Boer War

The British army began the Boer War much like it had the other colonial wars of the late nineteenth century, but quickly discovered that battlefield circumstances had changed. Suddenly the enemy had the technological advantage, and, in addition, the British found their organization to be faulty. Thomas Pakenham has thoroughly chronicled the Boer War and British shortcomings, and the details need not concern us here. ¹

These problems provoked changes. After the war, infantry, cavalry, and artillery tactics were re-examined, especially in light of new weapons that were introduced at the same time. Unfortunately, these examinations were essentially separate, with each branch working out its own problems. While the war proved a need for combined-arms tactics, afterwards the three branches reverted to a form of isolationism.

Two elements of artillery organization during the Boer War followed tradition. First, each force had a senior artillery officer attached, to command the guns in line with the force commander's plans. ² However, when he took command of the forces in South Africa, Kitchener specifically abolished the position of General Officer Commanding, RA (GOCRA) on the grounds that it divided responsibility in the chain of command and was illogical. ³ On paper this was true, but it was no worse than many other problems; on paper most of the British army's organization was illogical. Usually the army had muddled through, and the change probably owed more to Kitchener's personality and desire for centralized control than battlefield necessity. Second, there was an artillery staff, but it was located back at GHQ and concerned almost completely with administrative and technical matters, supplies of ammunition and horses, promotions and the like. ⁴ Staff duties had hardly changed since the Peninsular Campaign. ([Appendix 1](#) contains a report on what the artillery staff did.)

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Tactical and technical shortfalls limited artillery effectiveness in South Africa. Doctrine declared the brigade, composed of three batteries, to be the standard unit. This did not happen, and batteries were frequently used alone, or even split into sections (pairs of guns), so that every mobile column included artillery. ⁵ With artillery scattered in batteries and detachments, there were never enough guns or shells concentrated to decisively influence a battle. Nor was there much need for a command chain; artillery simply answered to the force commander, who typically had few enough subordinates that he could directly manage his artillery. The measured judgment of the regimental historian was that "[r]eal efficiency could scarcely be hoped for until the brigade had been made a permanent unit with a proper staff, and that was not to be conceded until forced upon the War Office by the stern logic of war." ⁶ In other words, it took the proof of battlefield experience for the army to obey its own doctrine. Until the point was driven home, peacetime administration and economy meant a brigade could be formed with batteries from three different stations, a commander from another post, and the adjutant joining from yet another. ⁷ Fire had to be directed without the benefit of signalers; to save money,

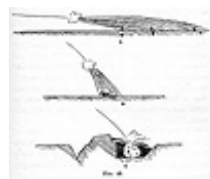
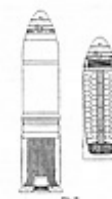
the army had abolished signalers for the horse and field artillery in 1899. ⁸ All this made it virtually impossible to handle a brigade as a unit, and it should be no surprise that the Royal Artillery could make little impact on the battlefield in the Boer War.

Without a GOC, RA, and with the feeble artillery staff ignoring tactics, the artillery had no voice in the higher councils where they might have had more success explaining what artillery could and could not do. Without any advocate, it was easier to do what the infantry wanted and simply scatter batteries among infantry brigades, which had the further advantage of being the traditional method. Changes were made after the "Black Week" of British defeats, but they came mainly from the brain of Lord Roberts, the new Commander-in-Chief and only by happenstance an artillery officer. While Pakenham notes the developments that took place in Natal, under Buller, the same policies were in place in Roberts' army in the Orange Free State. ⁹

Nor did the artillerymen fight hard to change things. In hindsight it was clear that the Royal Artillery came out of South Africa "opposed to the principle of centralized control," just at a time when that principle was becoming increasingly important. ¹⁰ It was not just the artillery that opposed centralization. Both the regimental structure of the British army and the Cardwell System (that rotated units between Britain and her imperial obligations) caused difficulties throughout the army in building large formations. The regimental system undermined efforts to standardize tactics even within branches (e.g., the infantry), much less efforts to foster combined-arms training or tactics. Units were almost their own little worlds. There were only limited opportunities for officers or soldiers to serve outside their own unit and learn something beyond their own unit's methods. The Cardwell System overlapped and reinforced this. Individual units (infantry battalions, cavalry regiments, artillery batteries) rotated between Britain and overseas service. Brigades were unstable collections of battalions, regiments, or batteries—unstable because of the level of turnover in their components. There was little incentive to overcome these problems: colonial campaigns were readily fought by *ad hoc* forces, while there was no European commitment that demanded larger combined-arms formations, such as divisions or even corps.

Technical problems also limited the effectiveness of artillery fire. The howitzers' high explosive (HE) shell was unreliable and gave its most visible results when it was not working properly. (It produced a yellowish cloud of smoke when the explosion was incomplete. The cloud was easily visible, and the explosion was more potent than black powder, but it fell short of the full power of HE.) The ineffectiveness of the HE shell caused great dissatisfaction with explosive shells in general, and the Royal Artillery instead embraced [shrapnel](#). Here, too, there were problems, for the non-quick-firing ([QF](#)) guns used in South Africa were mediocre for shrapnel firing, and that shell itself was flawed.

Everybody, not just the artillery, thought the problems with shrapnel were serious, so much effort went into improving shrapnel. Artillerymen joined wholeheartedly in exalting shrapnel. Shrapnel had been a British secret weapon in Napoleonic days, and it had been the centerpiece of British field artillery for nearly a century. When trouble developed, artillerymen solved their parts of the problem with better shrapnel shells and optimized guns.



They did not start a movement to reassess the place shrapnel played in British tactics, which would have needed support from the whole army. Shrapnel was superb for a specific function—killing men in the open—but was of very little use for anything else. It was also best suited for direct fire, and had serious range limits. Despite these drawbacks, which pushed the army toward other decisions and compromises about tactics, there was a definite choice of shrapnel

over HE, not simply an acceptance by default. Thus, because there was no point in firing shrapnel at long ranges (it lost velocity and consequently effectiveness), the Royal Artillery adopted a gun carriage that limited range.

Mobility of equipment was another great lesson from South Africa: there were often problems getting guns where they were needed. The lesson was to build guns and carriages

as light as possible, again at the expense of range. The carriage adopted for [horse and field artillery](#) had a pole-trail that was substantially lighter than a box-trail but that limited the gun's elevation and thus its range. To be fair, the British army needed equipment to fight anywhere in the world, not just in Western Europe. [Howitzers](#) saw action in South Africa, but relatively few of them because they were not as mobile as [field guns](#). Their clumsiness provoked unfavorable comments even though they were effective in combat. Even a few siege pieces went abroad, intended for use against Pretoria's forts. Understandably, they were not very mobile. Most of the mobility problems in the field during the Boer War were due to the poor transport arrangements. Nobody had thought about using siege artillery in the field, and the guns were towed by oxen and bullocks. The guns themselves were reasonably mobile, but their bad handling was what was remembered.

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Changing technology also forced the dispersal of guns. Infantrymen now carried magazine rifles with smokeless ammunition, accurate to 1,000 yards and lethal at twice that range. Even inaccurate rifle fire, if there was enough of it, created a fire-swept zone, a major tactical revelation of the South African war. Artillery now had to keep its distance from infantry. Thus the firing ranges at artillery practice camps doubled to 4,000 yards between 1899 and 1904. [11](#) To go closer to an unshaken enemy was a recipe for another Colenso, where guns were abandoned after deploying in an exposed firing position inside rifle range. The bullets may have sounded like thousands of bees buzzing, but they had a deadly sting. Moreover, increasing infantry firepower meant they could spread out more, especially in defense, and still concentrate enough firepower. Wider unit frontages made it harder to outflank the enemy in South Africa, and when combined with the numbers of troops available in Europe this development would just about end outflanking opportunities.

Now attackers had to focus more on suppressing the defenders' fire and probing for a weak point than on an outflanking move. Artillery was, in theory, the main way to beat down enemy fire. But the artillery had been split up and parceled out among the infantry. The feeble central command and lack of signalers to transmit orders meant that detaching batteries probably made sense under the circumstances. That it was the least-bad option was allowed to obscure the point that it was in fact a bad option, and that better communications were vital. Splitting the guns up also reinforced the mistaken idea that the guns themselves needed to be in full view to provide fire support, that direct fire was artillery's purpose.

Postwar Reforms

These were tactical wartime changes, adaptations, and improvisations, but after the war technology intervened. The key change was making quick-firing guns standard. These had an integral recoil mechanism so the gun did not have to be pushed forward after firing; gunners could now stand behind the gun. Gun shields were also fitted, and protected the crew from rifle fire. There were a very few British QFs in South Africa, but they were rapidly adopted afterwards, which greatly altered tactics. At a stroke artillery firepower increased and vulnerability fell; perhaps the "lesson" of Colenso could be ignored, and guns again could duel infantry with Mausers.

Foreign Influences

The 1904-5 Russo-Japanese War demonstrated some features of future wars, but was widely thought to have little relevance for Britain. [12](#) There were lessons for gunners about ammunition expenditure, [indirect fire](#), centralized command, and sieges. Although both Russian and Japanese artillery fired shells at previously unimagined rates, the general European response was not to increase ammunition stocks, but to preach the virtue of economy. In Britain, this approach suited the Treasury as well as the senior officers: the Treasury wanted to control military spending, and generals stressed high training standards. Indirect fire was another salient lesson from Manchuria, but was deprecated even there. Japanese gunners, despite delivering effective fire from [covered positions](#), were excoriated by their own infantry for not being forward in the firing line with the infantry.

With even the protagonists lamenting this development, it should be no surprise that most observers agreed. The use of massive siege artillery was another novelty. The Japanese deployed 11-inch howitzers around Port Arthur, eventually cracking the fortifications. The wider utility of siege guns was partly hidden because this was a textbook siege; few noticed how much the trench lines of other battles mimicked sieges. The RGA rewrote their manual about sieges, and the Royal Engineers were in the process of revising theirs in 1914. Interest in this war as a whole was not particularly high, and the best articles addressing it in the *Journal of the Royal Artillery* appeared from 1912 to 1915. ¹³ The general feeling was that there were few lessons for European wars to be learned from something on the other side of the world involving two second-rate military powers. In Britain, the practical lessons were shortly competing against a more exciting French doctrine.

Between 1908 and 1911, French artillery, and indeed the whole French army, was adopting a more aggressive and offensive attitude. For the artillery this meant operating mainly by batteries, up with the infantry and possibly even in front of the main firing line. Artillerymen were not to economize shells nor waste time aiming precisely, but instead to shatter the enemy's morale with *rafales*: sudden, intense, short spurts of fire. The objective was not destruction; the artillery was supposed to neutralize enemy fire for the critical moment of the infantry assault. In France this was combined with the resurgence of a morale-based concept of war as exemplified by talk of the *élan vital*, reintroduction of *pantalons rouge* with the claim that distinctive uniforms would raise morale, and adopting offensive war plans. Strategy and tactics fit together logically, if wrongly. In Britain it meant seriously reevaluating the Boer War's bloody lessons about advancing under fire. Movement became much more important than previously, and firepower less so. In 1910, doctrine switched from being governed by the axiom "the decision is obtained by fire" to "fire superiority makes the decision possible." ¹⁴ This was more than just phrasing in manuals; it was the army returning to traditional and popular views. The bayonet was back; cavalry kept their lances and sabers. Artillery would operate, if necessary, in front of the main infantry line. ¹⁵ The more cautious post-Boer War doctrine had lasted a decade in the British army. Even before the full flowering of French influence, senior officers stressed guns "support[ing] the attacking infantry by the fire of advanced sections at close quarters." ¹⁶ The hesitant steps towards concentrating guns were overturned. Artillery was dispersed, with each infantry or cavalry unit having its "complement of artillery." ¹⁷ Fitting this idea of suppressing rather than destroying the enemy, targets at practice camps were altered from points to zones. ¹⁸

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The British army was not simply accepting a foreign doctrine about destruction or neutralization. British colonial campaigns had long centered on killing the enemy, because simply chasing an irregular foe off a particular hill seldom won a campaign, whereas slaughtering the "natives" was more effective. South Africa showed the difficulties of destruction, even with unprecedented quantities of shells. As British bombardments grew heavier, the Boers dug deeper (or rather they had their African servants do the actual digging) and survived. The later battles in Natal pointed toward neutralization by showing how effective close infantry-artillery co-ordination could be. In following the French, the Royal Artillery adopted a more sophisticated doctrine and one better suited to European warfare, although location did not figure in the debate. But the mission and munitions were mismatched. Shrapnel was a killing round, not a suppressing/neutralizing one. High Explosive was misunderstood, as was the entire subject of [terminal ballistics](#): some even claimed that HE was less effective than black powder because HE shells produced smaller fragments. (The misunderstanding of blast effects would play a role in the confusion over "shell shock.") Doctrine held that HE was only useful for destroying *things* and had minimal effect on *people*. In reality it was effective against both; although somewhat less effective against people in the open, it was more effective against people in cover. Artillery fire was judged entirely in terms of the numbers of bullet-equivalents it produced, not their effect on the enemy. All effects were judged in terms of killing, not suppressing, which was contrary to the new doctrine.

Organizational Structure

The Boer War caused a shake-up of the organization of the British army, especially of larger formations. On paper, several Army Corps had existed since just after the Franco-Prussian War, but nobody tried to reconcile paper and reality until 1902. ¹⁹ In theory, units were assigned to Army Corps, but there were not enough units: phantoms that "would be formed later" filled the gaps. Paper divisions had two infantry and two artillery brigades, and corps had a few additional howitzer batteries. There was a solid, functional, system establishing the duties of the "officer commanding the artillery of an army," "the OC the artillery of an army corps," the "OC the corps artillery," and "the OC the artillery of a division." ²⁰ In outline, this was the system Kitchener had abolished in South Africa, and it could work reasonably well with the small numbers of guns and simple techniques envisioned before the Boer War. It was also close to the system that would, of necessity, be recreated during World War I, but that did not clearly define duties. However, since these corps never really existed, commanders were never appointed nor were there (even theoretical) staff officers beyond aides-de-camp or adjutants. The corps artillery was also fictitious, mostly the batteries "to be formed." As an example, brigades of heavy artillery existed on paper for three years before actually being formed, and when they were formed the organizational charts had changed so they no longer had a role. ²¹

The Haldane reforms starting in 1907 were of far greater substance, and linked with the emerging artillery doctrine. Haldane cut his suit to fit the fabric, disbanding feeble units to strengthen and consolidate the rest; the regulars became an Expeditionary Force. The bulk of the forces in Britain would be organized into six large divisions, each of three infantry brigades and four artillery brigades. There was a GHQ in command, with the possibility of the corps as an intermediate echelon. Corps was not an important level of command, since divisions were complete in themselves: they had infantry, artillery, and mobile troops, while corps had virtually nothing. While the new BEF was organized for a European war, the flexibility of its all-arms divisions would have been good for a colonial war, and the corps could have also been useful for a large colonial war. Originally it had been thought that GHQ would command divisions directly, so the corps level had little authority. ²² There was only one real corps command in peacetime, while there were divisions enough for three corps. II and III Corps would have to be extemporized, and even I Corps would be fleshed out with officers switched from other duties.

One retrograde step was the abolition of the Corps GOCRA, presumably because there were no guns for him to command directly, and anything else would step on someone else's toes. The re-organization of the army did not drive tactical changes; the two had been considered separately. There was still a field-gun brigade for each infantry brigade, and when Haldane abolished corps artillery he simply added that artillery to the divisions, so the fourth brigade was field howitzers. There was even a battery of heavy guns. But more divisional artillery, with howitzers and medium guns, required new command measures: one man could no longer control everything.

Chain of Command

At the divisional level, in 1907 a CRA (Commander, Royal Artillery) was appointed, a step that had been specifically rejected in 1901 and 1904. ²³ Furthermore, he was to be a brigadier general, equal in rank to the infantry brigade commanders. But his duties still lacked explanation, with the most recent list dating from 1902 and the old corps system. While having a CRA was the logical corollary of doubling the division's artillery strength, it was not accompanied by the creation of an adequate staff. Despite commanding more men than a cavalry brigade and more horses than the whole of the rest of an infantry division, a CRA had only a single staff captain (who was not even a fully trained staff officer) and a few orderlies. ²⁴ There were gradual increases, notably the addition of a brigade major, but they did not get at the root of the problem: the CRA was a fifth wheel.

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It took five years to even settle a CRA's peacetime duties. His main task was training, but

that was a tiny role. ²⁵ Divisional artillery training received one day a year at practice camp, and ranked behind both battery and brigade training. ²⁶ ([Appendix 2](#) has a discussion on training at the time.) Even this was undercut by the reluctance of some divisional commanders to allow their CRA real responsibility.

The CRA's wartime role was even murkier. Between 1902 and 1912, manuals gave little guidance, and the debate was mostly conducted in the pages of the *Journal of the Royal Artillery*. Authors freely interpreted the *FAT's* intent, quoting various sections to support their own views. Depending on the author's views, the CRA might be responsible for: integrating the artillery with infantry operations; reconnoitering artillery positions; controlling and directing fire targets; being a "consultative staff officer"; being at headquarters "at almost all times"; passing intelligence to the infantry; or keeping a reserve of guns under his own command. ²⁷

The CRA's wartime duties were finally settled in 1914, and exactly mirrored the artillery's position in the army: supporting the infantry, while never forgetting the artillery's subordinate position. How to do this was left unclear. The CRA might have some discretion, and maybe even some independence if the division commander allowed it. But his role was marginal, because many people still focused on brigades as the main tactical unit and thought the CRA should not interfere with his subordinates but only be a technical adviser to the division commander. ²⁸

Even if he had some authority, a CRA's communications resources undercut him. ²⁹ Since the general view was that infantry brigades would be semi-autonomous, field gun brigades were frequently divided amongst them, with infantry and artillery brigades pairing off for semi-independent operations. Under these circumstances, artillery signalers might well be better employed linking with the infantry than with their nominal commander, the CRA. ³⁰

The lack of communications was even more crippling than the tiny staff.

A CRA had precisely three signalers, three mounted orderlies, and two bicyclists. ³¹ To compound the problem, brigades had few



communications resources of their own, and to economize the brigade commander was expected to stay with one of his batteries. ³² Indeed,

brigades only had enough telephone cable to link their batteries; if they wanted to link to the infantry or the CRA, someone else had to provide the cable. ³³ The only source for help was the divisional signals company, which was already busy just connecting the infantry, divisional HQ, and the service units. One captain summed the situation up:

Neither the Signalling Manual nor Field Artillery Training give any information with regard to the establishment of communications between the [CRA] and his brigade commanders. "War Establishments" names a staff, with a strength difficult to know how arrived at and not equal to the equipment allowed by Mobilisation Store Tables. ³⁴

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With it nearly impossible for a CRA to actually command his guns, it is not surprising that old-fashioned decentralization was so prevalent. Although the brigade was supposed to be the standard tactical unit, some officers skipped straight past the battery and stressed the two-gun section. ³⁵ This was partly the result of brigades still being dispersed, for Treasury parsimony had delayed expanding barracks to allow for whole brigades to be stationed together. After three years of a barracks expansion program, only 27 of 50 brigades were united. ³⁶ Brigade training suffered as brigade commanders found they could do little more than train the battery commanders; they assuaged their consciences by calling this their "essential duty." ³⁷

The CRA at the division level was obviously weak, while the brigades were relatively stronger but still fairly weak. The only cohesive unit was the battery. While sections were

the exception, many senior gunners expected the divisional artillery to be broken up and attached, one brigade of guns per infantry brigade, and sometimes one battery per battalion. ³⁸ From 1907 (that is, as soon as Haldane's big divisions were finalized), artillery and infantry brigades were "affiliated" for training and exercises, which was simply the continuation of the old ways. ³⁹ Tradition dictated that artillery "organization must depend directly upon that of the infantry," and this remained the underpinning of British artillery doctrine. ⁴⁰ Indeed, regulations called for detaching batteries, "sections or even single guns in close support of the firing line" when fighting in close country, which may have been a reason for leaving batteries with relatively large signals establishments. ⁴¹ Again, this would have not been necessary if there had been adequate signals equipment higher up, or if commanders had recognized that artillery fire was more important than the presence of guns.

There was a perverse benefit in splitting off the 18-pounders—CRAs would have only the howitzer brigade and the 60-pounder battery, precisely those pieces least suited for direct fire support. ⁴² The CRA's signals resources could just cope with this limited force, and this may have been the unspoken intention. The other side of the coin was that these units required disproportionate amounts of signals to control, complicating the handling of the field guns, which became a bone of contention for more aggressive officers. ⁴³ ([Appendix 3](#) is a contemporary discussion of many of these topics.)

Aggressive Use of Artillery

While "indirect laying ... *is the normal method employed in the field*," gunners were well aware that their job was infantry support, regardless of method. ⁴⁴ There was too much talk of a "spirit of close support" (the parallel of the infantry's "spirit of the bayonet") or the artillery "entering the 'ring,'" and *FAT 1914* spoke of the artillery moving forward to support attacks and of "the moral effect of batteries advancing boldly." ⁴⁵ Guns were felt to raise the morale of nearby infantry, and boldness was good for gunners, too. ⁴⁶ The effects of enemy firepower on gunners' bodies, let alone their morale, were not mentioned. This was part of accepting the French doctrine, which itself marked the defeat of the firepower school within the British army. Gunners were overly willing to sacrifice the strengths of artillery—long range and indirect fire capability—when the infantry wanted the reassurance of guns deployed in the front line. They followed both tradition and what regulations suggested. ⁴⁷

In the Boer War, the British army had learned the effects of firepower, and afterwards adopted a firepower-centered doctrine for future wars. In only a few years this shift was overturned, and the emphasis was again on morale and maneuver. For the artillery, the switch back was most visible in the adoption of French-influenced doctrine, but the movement was broader. The cavalry kept the lance and saber. The infantry focused on morale and manpower—and especially on reinforcing the firing line by weight of numbers—rather than exploiting mechanical means of fire. The man was more important than the machine, marksmanship more important than machine-guns. In Britain, the ratio of guns to infantry was actually falling, while Continental powers were adding guns. The British relied upon the mobility of the guns themselves to compensate for their declining numbers. ⁴⁸

Once again, shrapnel fit the situation and made the Royal Artillery look highly efficient. Shrapnel produced a high volume of fire: a battery of six guns firing at four rounds per gun per minute would fire 9,000 shrapnel balls in a minute. While no small achievement, this was thinking and acting on the infantry's terms: firepower was being defined in terms of bullets, not in terms of effect. The writers of the manuals clearly saw the artillery simply as bolstering the infantry, running the guns up into the line and blazing away. British infantry, like the Japanese, wanted guns deployed forward, even if that reduced their effectiveness. ⁴⁹ Many gunners were more than willing to play this role. An influential colonel wrote: "There is absolutely no excuse for artillery remaining idle in face of the enemy; if they

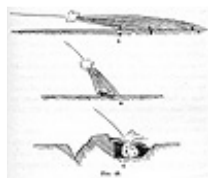
cannot see him, they must push forward until they do, even if this entails their being used as machine-guns." ⁵⁰ Rising officers wrote that covered positions were for "annoyance rather than business," and the gunner's business was "the encouragement [of his own infantry] whether it be damaging the enemy or not." ⁵¹ *FAT* suggested a compromise—concealed maneuver into firing positions—but gunners were reminded that

Concealment, both as regards position and man|uvre, must invariably be foregone for adequate reasons. To support infantry and to enable it to effect its purpose the artillery must willingly sacrifice itself. ⁵²

This was unambiguous and bold, and most gunners were happy with it. The alternative to the shrapnel/neutralization/infantry support school was that of artillery destroying the enemy. This would have cast artillery not only as a combat arm, but also as the decisive arm; it would have been a lurch to an extreme firepower (rather than morale/maneuver) doctrine. This idea was rightly rejected. There was no chance of the rest of the army agreeing, nor would the Treasury have bought the ammunition. It would not have made tactical sense. Artillery today (even with precision-guided munitions and air support) cannot utterly destroy an enemy. Even on paper, such plans take an immense amount of time, require very large forces, and hand the initiative to the enemy, who can choose to sit under the shellfire, launch a preemptive attack, or withdraw. With the alternative unthinkable, the Royal Artillery accepted the role of a combat support arm. That was a reasonable role, but it still fell short of a solid combined-arms doctrine.

Field Artillery Tactics

Having settled their place in the army, it remained to determine the artillery's tactical role. Since future wars were expected to be mobile and fought for key points of terrain, instead of on a continuous front or in depth, the Royal Artillery took enemy infantry as the main target. Gunners would also fire shrapnel at enemy artillery, but since tests showed it was minimally effective against guns (and their shielded gunners), counter-battery fire was a low priority. The French doctrine was altered little despite the differences in equipment between the countries. Sudden, heavy shell concentrations created a momentary superiority in fire that helped the infantry move forward. Guns would be placed up among the infantry, firing at the same targets. Concentrated fire would shake enemy morale just before the infantry or cavalry charged. The safety distance, within which guns could no



longer support the infantry, was set around 400 yards. (Wartime experience would prove this to be much too far, especially against machine-guns.) This was a by-product of optimizing the 18-pounder to fire shrapnel. Shrapnel had its best coverage with a relatively flat trajectory, but that flat trajectory meant a longer safety distance both near the guns (as the shells were ascending) and around the target where the shells were spraying their shrapnel balls. Despite the fact that

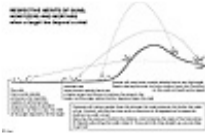
artillery were supposed to help foot soldiers before the charge, the figure of 400 yards actually doubled the previous range at a time when other armies were reducing this distance. ⁵³ Inside the 400-yard range, the field howitzers would take over providing covering fire because their arched trajectory produced a narrower shrapnel danger zone. ⁵⁴ Meanwhile, the 60-pounders would be harassing enemy reserves and interdicting rear areas, or perhaps firing in enfilade from positions further along the front. ⁵⁵

The main consideration in selecting firing positions was ease of fire. The shortages of communications equipment and personnel meant most guns had to deploy within sight of the enemy. Some officers saw little trouble with the lack of signalers, imagining batteries deploying in line under the brigade commander's eye, where he could manually (and



digitally) indicate targets. ⁵⁶ In this spirit, officers were told that "view of the enemy was the second priority of a good gun position, behind only being in range." ⁵⁷ It was possible even to complain that howitzers, using covered positions at practice camps, were firing from

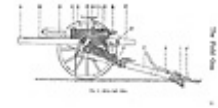
"too far back." ⁵⁸ This ignored the simple fact that howitzers' trajectory made them harder to handle in direct fire than guns. Manuals defined three categories of positions: "open," "semi-covered," and "covered." ⁵⁹ An open position is self-evident, and a covered position kept the battery and its muzzle-flashes concealed; the semi-covered position was a compromise that kept the guns hidden, but that rendered evidence of their position (muzzle flash or dust) visible. No official preference was expressed, but when the *FAT* noted that covered positions "increase difficulty of control, frequently necessitating artificial means of communication ... and the use of plotters," the implication was clear. ⁶⁰ Such positions were not for ordinary use—not least because few batteries could find, let alone use, a plotter—and writers struggled to find any reason for them. Counter-battery fire was already considered the likeliest, but was a very low priority and sometimes could be performed from open positions. ⁶¹ While few officers devoted much thought to destroying enemy guns through shellfire, some of the same results could be achieved by drawing enemy fire onto exposed batteries, and off the similarly exposed infantry. If the effects were painful, they were expected to be temporary because the British infantry would surely capture the enemy guns. The heavy battery was seldom expected to engage over open sights, but it at least had double the number of signalers (it was expected to work in two sections) and was more familiar with indirect fire. ⁶²



Field Artillery Equipment

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At least these tactics fit well with the equipment available. The most common field piece was the 18-pounder field gun, a modern quick-firing (QF) weapon with a gunshield. A division had 54 18-pounders, organized in three brigades of three batteries each with six guns. This was the world's heaviest field gun, firing the heaviest standard shell, and it had been adopted for its excellence in firing shrapnel. Shrapnel was its only round—high explosive had been specifically rejected—but partial compensation came from the explosive effect of the large shrapnel round. Adding a bit of smoke from shrapnel had been debated, but technical difficulties and conservative thought doomed it (it was deemed a "cuttlefish policy, too fanciful for our consideration"). ⁶³ The 18-pounder was built for a very flat trajectory, making it admirable for sweeping shrapnel through targets in the open. To abet the flat trajectory, the carriage limited elevation and hence range; this would not be a problem for its expected direct-fire missions, and by saving weight the design increased mobility. The sacrifice of range was another part of the shrapnel obsession. Shrapnel lost much of its effectiveness at long ranges, so the British decided to give up long range rather than give up shrapnel. The flat trajectory also limited the guns' usefulness against targets in cover. Buildings were not so much the problem as entrenched infantry, or even gunners behind gun-shields.



These targets were why the Royal Artillery adopted a light field howitzer, of 4.5-inch caliber, firing both high explosive (HE) and shrapnel shells. Infantry divisions had one brigade of three batteries, a total of eighteen howitzers. They fired HE and shrapnel, which had been added since the Boer War when howitzers were issued only HE. The shrapnel shell was useful since the howitzers' high trajectory meant they could shell entrenched troops, or gunners behind gun-shields. The HE round was intended to destroy minor field works and buildings. Conservatives argued that, because howitzers had HE shells, the field guns did not need any. However, shrapnel was now the howitzers' dominant munition; the HE round was designed with similar ballistics to shrapnel (and to be useful for ranging) when a different design would have produced more explosive effect. ⁶⁴ Optimists claimed howitzers could flush enemy troops from cover, getting them into the open and making them more vulnerable to 18-pounder shrapnel. Not only was this unlikely against a steady opponent, but it required lots of time and ammunition, the latter being sure to be in limited supply. Howitzers were expected to operate in direct support of the infantry, so the 4.5-inch howitzer had a gun shield, and gunners practiced point-blank fire to defend themselves against charging infantry.



The last artillery type in the division was the 60-pounder, deployed in only one four-gun battery. It was a modern piece, but since it was intended only for long-range fire it lacked a shield. 60-pounders carried mostly shrapnel, but had some HE. It added a useful capability to the division but was essentially bolted on, lacking a clearly defined role. The heavy battery did not fit into combined tactics and was essentially for opportunity targets. It was really a carry-over from the Boer War, when a little long-range shelling often dispersed groups of Boers.

As a whole, then, British artillery weapons were optimized to fight an enemy who stayed in the open and at moderate to close range. There was no good answer for men in cover. Few guns had long range. If the enemy were in close terrain, weak communications meant guns had to be pushed forward into direct fire positions. The final weakness was that of considering British artillery in isolation, ignoring the effects of enemy artillery. In this regard the Royal Artillery were simply putting their heads in the sand. Because they could not seriously hurt the enemy artillery, surely the enemy could not hurt the British. This was a "lesson" of the South African war; not a single Boer gun was destroyed by British shellfire, and the Boers had too few guns to harm the British artillery. Moreover, once gun shields were fitted and protected the crew from shrapnel and small-arms fire, it appeared that any existing problems had been solved. Of course, the lesson was not the right one, and the error was compounded by the focus on shrapnel.

The Royal Garrison Artillery

The exception to the field artillery's relentless focus on close support was the Royal Garrison Artillery. It had the quadruple responsibility for coastal artillery, siege artillery, mountain artillery, and the few heavy batteries. Most of these duties did not require horses, and garrison artillerymen put the time saved from stable duties toward improving their proficiency at long-range gunnery. Garrison artillerymen also had a three-month gunnery course, while their Mounted Branch counterparts spent only one month in training. ⁶⁵ In November 1913, an RGA major was laughed at for suggesting that batteries take a thermometer and barometer into the field, and the RFA lecturer replied that he could not agree with a "plea for greater [predicted] accuracy ... the gun is the best range-finder, better than all the scientific instruments in the world." ⁶⁶ In other words, the best thing to do was blaze away and correct your fire as you went rather than bothering to try and hit with the first shells. The major also pointed out that the FAT mentioned correcting for environmental conditions, but then did not say how to do so. The only RGA units attached to the field army were the 60-pounder batteries, and we have seen how poorly they fit into the infantry division.

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The RGA also fielded [siege artillery](#), all of it howitzers. For a siege, howitzers were more useful than guns. Not only did their shells plunge down, getting into trenches and threatening to crack forts, but because howitzers had a lower velocity, their shells could carry more explosives. (The lower velocity put less strain on the shell, which could have thinner walls and thus carry more payload.) The British army used 6- and 9.45-inch siege howitzers. The 6-inchers were moderately useful, although nearing obsolescence. Their range was limited and they lacked a robust recoil mechanism. There were only sixteen in the whole British army, with a wartime organization of two brigades each of two batteries. The 9.45-inch howitzers were an emergency purchase from the Austrians when it appeared the British might have to besiege Pretoria and were never fired in battle. They had very short range and very poor mobility; there were only eight of them, enough for one brigade of two batteries. On the whole, the British army had too little siege artillery and it was too light in caliber. While the French were even worse, having virtually no siege weapons, the Germans had both examined modern fortresses (and thus obtained more and heavier weapons) and had attached good medium-caliber weapons to their field army.

Siege Artillery in the Field

So far we have only looked at mobile operations, either encounter battles or hasty attacks. The British army compartmentalized its thinking very thoroughly, and not only defensive operations but deliberate attacks and sieges received virtually no attention. There was no anticipation that siege artillery would actually participate in a war. Although it might "be added [to the Expeditionary Force] as circumstances may demand," the *Field Service Pocket Book* did not mention siege artillery at all. ⁶⁷ This is mildly curious. Though the army had very little siege artillery, it had participated in the 1913 maneuvers. ⁶⁸ (There was one battery on each side. Because the RGA did not keep horses in peacetime, civilian carters were hired to move the batteries. The batteries had little impact on the maneuvers, neither the plans nor the outcome. They opened fire on each other, and the judges ruled that each battery destroyed the other with the first salvo. It is tempting to conclude that the rest of the force wanted to get the siege artillery out of the way). ⁶⁹ The tactical role of siege artillery was also nebulous. One suggestion was destroying obstacles, although this was never practiced on the firing ranges. ⁷⁰ If not shelling obstacles, the mission changed to fire against personnel: siege artillery were issued shrapnel "as it is the personnel that has to be overcome before the position, whatever it may be, can be captured." ⁷¹ Thus siege and field artillery had very similar duties, and that narrowed the circumstances in which siege guns would be needed (and when they would encumber the army) to the point that its only clear task was driving in the outworks of a fortress. For this purpose, the 6-inch (medium siege) howitzers, plus whatever odds and ends were scraped together, would be deployed. Their specific goal was to make sure The Siege Train was only deployed for major sieges and thus did not encumber the BEF. ⁷²

Siege artillery had separate command arrangements, with separate brigades but under a "commander of the besieging artillery." Communications were a sticking point: three siege brigades existed, but the army had only enough resources to link two, the Royal Engineers' signalers being expected to do the rest. ⁷³ It is not clear to whom the brigade commanders answered during mobile operations, but presumably directly to GHQ unless assigned to a division. Siege artillery was not even part of the BEF; technically it was part of The Siege Train. Rumor had it that because siege guns could not be landed across a beach, which might be necessary for a colonial campaign, it could not belong to the Expeditionary Force. ⁷⁴ But if the area of operations was so remote that the Expeditionary Force had to land (and apparently then be supplied) over a beach, they were hardly likely to need siege artillery anyway. If this argument was really heeded, it is sad commentary on the British army.

If operations were somewhere between a siege (it seems the British still thought of formal sieges, complete with *parlementaires* and drummers) and open warfare, there were no artillery command arrangements. The army was sure it would not happen, so nothing more than paper generalities were needed: methodical progress "should make the CRA's task of fire-control somewhat easier." ⁷⁵ A slower advance would ease strains the communications network, and strengthen the CRA's role. ⁷⁶ This suggests that decentralization and detachment were recognized as harmful to the artillery's advantages, for central control would allow employment "as required by the exigencies of combat." ⁷⁷ But the manuals were silent—in hindsight eloquently so—on just how to do this.

This gap between siege and mobile warfare was not the only one existing in the British army. Haldane's reforms had created real Army Corps, but without artillery commanders anywhere above the division level. The last chain of command for artillery was laid out in 1902, under the old corps system, before QF guns were adopted or Haldane reorganized divisions. It is unclear why this system was dropped (and not revived until 1916), but perhaps it was felt the larger combined-arms divisions needed less support from above. Anyway, there was little help available; GHQ and corps had only their own staffs and administrative troops. On the other hand, there was very little artillery outside the divisions to require handling. The Siege Train was only for sieges. The only problem was the medium siege weapons that might or might not be deployed.

With virtually no weapons to command, it was not unreasonable to have only an "Artillery Adviser" at the corps and GHQ level, without so much as a clerk to help with paperwork, and leave his role undefined. ⁷⁸ The job did not need a lot of preparation, and the men would be appointed at the point of mobilization; until then the only artillery staff officer below the War Office was the "Staff Officer for Artillery" at Aldershot. ⁷⁹ He was hardly the modern model of a staff officer. His wartime position was neither staff officer nor Artillery Adviser, but rather CRA for the Cavalry Division, and his staff would come from the Riding School. These men followed the nineteenth-century model of staff officers and were gallopers, not planners. With these presumptions, it was reasonable in 1912 to consider the brigade the higher level of command, and to not mention artillery officers above the division level. Larger forces could simply be noted as having "no CRA." ⁸⁰

Conclusions: The Pre-war Artillery

As discussed above, there was no framework for commanding artillery above the divisional level, and only a weak one for handling the divisional artillery as a whole. It was assumed that artillery would be entirely subordinated to the infantry in maneuver battles, and maneuver battles were the only ones that had been even halfway-adequately studied. The Siege Train was for formal sieges, but was too small both in numbers and sizes of guns to be truly effective. There were no answers for the problems that would arise in 1914. Pious hopes were voiced for centralized command in set-piece attacks, at least recognizing that it was necessary. Though correct in theory, there was no way to make it happen. Communications were inadequate for both methodical attacks and mobile actions alike, and were perhaps worse in set-piece attacks, which were not suitable for visual signaling and threw the whole load on telephones and runners.

Underpinning the artillery's role was its proper subordination to the infantry, but this principle was taken too far and the artillery was expected to do more of what the infantry did and was placed up amongst the infantry. As a result of this thinking, its guns and shells were optimized for this task. This ignored the advantages of artillery: long range, indirect fire capability, and heavy firepower. There was not enough communications equipment to implement a centralized artillery command system, so decentralizing and working closely with the infantry and cavalry was a necessary compromise. The mistake lay not in accepting it as a temporary condition, but in accepting it too enthusiastically and thus neglecting what made artillery different.

1914: The Test of Battle

These were the principles in place in 1914, and the Royal Artillery stuck with them as long as they could. ([Map 11](#) shows the Western Front in 1914 with the sites of major British battles.) The BEF took its integral artillery to France, and nothing else; nobody wanted The Siege Train. But intentions were one thing and real life another. Within days of the first battles, the BEF requested artillery reinforcements. The first siege batteries soon embarked and saw action in mid-September at the Battle of the Aisne. ⁸¹ In addition to Siege Train elements, various guns were scraped up from coastal batteries, depots, and testing grounds.



Horse and Field batteries operated as anticipated. They were administered as brigades and paired with infantry or cavalry brigades, but they fought in batteries. ⁸² Field howitzers were also handled in this way. Direct fire was frequently used. Sometimes a gun was pushed forward to blast a given German position, or a howitzer to demolish a building. ⁸³

Gunners did not hesitate to go forward, nor did the infantry hesitate to ask. Indeed, gunners were too willing to agree; at Le Cateau, the 5th Division deployed its guns in full sight of the Germans, and had to abandon half of them because German fire prevented the

horse teams from coming forward and removing them. The 3rd Division, fighting next to the 5th Division, used safe positions on the reverse slope. However, because communications over the ridgeline were difficult, the 3rd Division's artillery was somewhat less effective, although it survived to fight another day. ⁸⁴

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The BEF saw little action on the Marne, but the intersected country of the Aisne caused problems. Because of the pre-war emphasis on shrapnel, and their flat trajectory, British field guns had great trouble in the narrow valleys. They either had to be deployed further forward than they wanted to be, or so far back that shrapnel lost its effectiveness. 18-pounders generally stayed up with the infantry, with CRAs responsible more for supply than tactics. Communications were stretched to the breaking point (there simply was not enough telephone cable), and senior officers often found themselves shuttling around, maintaining contact with their subordinates, rather than commanding. One ADC in the 3rd Division noted that "anyone of us who wanted to consult any [divisional] staff ... had to drive or ride over to see him, often a matter of miles." ⁸⁵ Open positions were all that was available, and they were employed, regardless of the cost. Guns were used as infantry reinforcements, a reminder that the army saw them as simply another kind of bullet-deliverer, and also demonstrating the infantry's low firepower. ⁸⁶ As Alan Brooke later wrote, there was no combined-arms planning; the infantry decided what they wanted, and others did their best to conform. ⁸⁷ Howitzers, immensely useful in this terrain, were in short supply. They could fire from cover, had longer range than the 18-pounders, and their HE was effective regardless of range. When the first 6-inch howitzers arrived, they were immediately attached to divisions. Nobody tried a central firepower reserve, possibly because the communications network could not handle it, but there were also problems establishing a legal command authority.

This pattern held as the Germans were forced back and the BEF sidestepped to Ypres. Infantry and cavalry brigades fought with 'their' attached guns, while the CRAs commanded 60-pounders and howitzers. One CRA had command of only two batteries for "special tasks." ⁸⁸ Sometimes field howitzers were given to infantry who had a particularly strong position to attack. That gave the attackers a firepower boost, but at the expense of robbing other units, which went without until the batteries were redistributed. Occasionally batteries were used in quantity, as when Sir John French supervised the concentrated fire of all five heavy batteries on various German batteries. ⁸⁹

But with no mechanism for concentrating fire across divisional boundaries, this sort of concentration was extremely rare. ⁹⁰ CRAs had to personally develop cross-fire between divisions or, thanks to the dispersion of their division's guns, even within their own divisional sector. ⁹¹ Without an artillery chain-of-command, it required a corps commander—or, indeed, Sir John French himself—to make it happen. With their wide discretionary powers, corps commanders could centralize artillery. Sir Douglas Haig, then commanding I Corps, on 18 September delegated to Henry Horne (his Artillery Adviser) "the organization of the artillery fire and the co-operation between artillery and aeroplanes." ⁹² Horne spent much more time working with the RFC than organizing artillery fire. Every clear day he personally went to the aerodrome and took reports from pilots; then, lacking legal authority as a commander, he had to pass suggestions to the CRAs. Haig formed a "Special Artillery Group" in I Corps, a mixture of field artillery, siege howitzers, and medium guns, which "acted directly under [Haig's] orders," not Horne's. This was an encouraging example of a centralized fire reserve, but Haig had to do this personally rather than being able to delegate to a subordinate. Having to directly command his personal artillery reserve must have taken some of Haig's time away from other duties. Ad hoc arrangements might work, but they did not establish a system that could be used outside I Corps.

As movement slowed in October and became nearly static at Ypres, the artillery adjusted. Defensively, the artillery pulled back to perhaps a mile behind the infantry, so that it

became unusual for guns to be deployed forward with the infantry. ⁹³ The key moment seems to have been when the infantry entrenched. Once the position of friendly troops was fixed, the risk of friendly fire dropped, and if shells did fall short at least the entrenchments reduced the effects. Liaison, therefore, did not have to be quite so intimate, and telephones or visual signaling could safely be employed. Communications also broke down as the infantry suffered heavy casualties. Infantry battalions could no longer hold as much frontage as 'their' guns could support. Eventually, the front was organized into sectors, with the artillery under the control of whatever infantry force happened to hold that sector. ⁹⁴ However, there was still considerable rigidity in the command structure: guns would only fire on their sector. Sectors also led to the development of "SOS" fire. At a signal (typically a flare) from the infantry, the sector's guns fired for a given period of time. The main purpose was to provide instant fire support so that a unit under attack did not have to call back to HQ and wait for fire support to be organized. One great advantage of using flares or other pyrotechnical signals was that they also worked at night (one of the first terms for SOS fire was firing on "night lines"), and they also worked when shellfire had cut phone lines. The link between the infantry and artillery within a given sector also meant that when infantry left the line, the guns did too, thus withdrawing their firepower. Certainly the gunners could use some rest too, and during the shell shortage having more guns available did not necessarily mean that more firepower was available. ⁹⁵

There was a commendable effort to find and disseminate the lessons of what worked best. ([Appendix 4](#) has an extremely early example.) One lesson about forward positions was learned from the early battles. These were now frowned upon, and were considered "emergency" measures with "no advantage over covered positions." ⁹⁶ Some lamented that "concealment has been forced upon our artillery," as if this had not happened in South Africa. ⁹⁷ Batteries generally fought together, although guns might be detached. Heavy artillery was the exception, and 6-inch howitzers were doled out as needed to smash houses or batter German entrenchments. ⁹⁸ With field guns still tied to the infantry, CRAs had only the field howitzers, the 60-pounders, and any attached heavy artillery. ⁹⁹ This was within their communications means, and the networks gradually improved as more telephones and cable arrived. Over time, brigades were connected to the CRA so that defensive fire could be shifted where it was most needed, if only within divisional sectors. I Corps even scrounged enough telephone cable to link its CRAs to each other, but still not to the Corps Artillery Advisor. ¹⁰⁰

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Communications problems led to other difficulties. Without enough cable to link batteries, coordinated fire was impossible. In theory, the BEF's central position in the Ypres Salient allowed a central artillery group to support infantry anywhere around the perimeter, but the advantage could not be exploited. The problem was quickly recognized, and more communications equipment (cable, telephones, and switchboards) was sought. Unfortunately, it only trickled out, and supplies at the front were always short. ¹⁰¹ Even if the communications problem had been solved, the idea of centralizing command was new. Scarcity often causes centralization to allow efficient use of the resources, but this also depends on adequate and timely communications, which circles right back to the original problem. As it was, the clumsy and brittle artillery arrangements worked, but without better signals the artillery could do no more.

The Artillery Advisors (AA) at corps HQs still lacked any purpose, and tended to be used as spare senior staff officers. ¹⁰² Even for multi-division attacks—when central planning might be expected—AAs were not involved. An Adviser could watch divisions in his sector preparing an attack without the slightest conception that he should take part, even when he knew "there was not enough preparation or organization." ¹⁰³ Instead, artillery support "was left to the discretion of the divisional commanders." ¹⁰⁴ There was great concern not to infringe upon commanders' authority. Perhaps this was a throwback to the "small wars" around the empire, when a force commander had virtually unlimited authority, or was a recognition of the squabbles and jealousies of the peacetime army. Whatever the reasons,

division commanders were generally treated gingerly by both corps HQs and GHQ. ¹⁰⁵ This was felt further down as well. Since brigades had traditionally been the main artillery unit, CRAs generally were too reluctant to give orders and coordinated or liaised instead of commanding. When the BEF was fighting a moving battle, this was not a big problem. Since signals could not cope with mobile conditions, artillery had to be de-centralized. It was not just because of the shortage of signalers and cable, although that contributed to the situation. Key technologies simply did not exist, and the same troubles would be experienced in 1918. More important, there was no ability to change plans according to conditions, no way to assert command after operations centered on Ypres. There was a tenuous artillery chain of command inside the division, but outside the division there was nothing, and inter-division co-operation depended on individual generosity or on the already busy corps commanders finding time.

The pre-war ideas regarding artillery's role were also changing. Direct-fire shrapnel was not the panacea it had been built up to be, nor was killing men the main problem. Targets, whether human or material, were under cover. First they had to be located, then hit. If they could be hit, shrapnel did not do enough damage. The lack of 18-pounder high explosive shells was keenly felt, and test batches from the factories were rushed to the front. New tasks arrived as well. Before the war, the artillery had been asked to "preserve the infantry's mobility," which had meant suppressing the enemy infantry for a few minutes. Now it meant cutting barbed wire and destroying machine-guns before an attack. Gunners also had to demolish defenses, both trenches and strongpoints. Even the RGA, the siege artillerymen, had not practiced on such targets, so the artillery had to start from scratch. Shells were too scarce to waste on experimenting. Experience came from battlefield results, but cost lives when things went wrong.

Even worse for the long term, the impression developed that trenches and barbed wire were the obstacles, rather than the German infantry, which they sheltered and protected. The emphasis in late 1914 was changing from suppressing the German infantry to destroying German positions, almost forgetting the troops that happened to be inside them. This erroneous view would increase in 1915 and peak in 1916, but origins were clear in late 1914. It is doubly remarkable that a morale-focused army switched to this view so readily and without comment. Counter-battery firing was more important than ever, but was less urgent than other problems. The Germans had their own shell shortages and communications problems, and their artillery was not yet the defensive factor it would be. The priority for the Royal Artillery remained infantry support, which was felt to be offensive, while counter-battery work was defensive and thus viewed as inferior. ¹⁰⁶ Furthermore, shells were precious and had to be used on the most dangerous target, which was usually the German infantry and machine-guns. One very progressive development was the use of aircraft in conjunction with artillery. The technology was primitive even by the standards of 1918, but the army realized this was a critical area to develop. Everybody worked on the problems: troops in the field, GHQ, and the War Office.

The end of the year saw the first breathing space for the BEF, the first pause for thought. In the roar of battle there had been little time to consider what should be done differently, and responses to changing conditions were haphazard. Nobody had any experience whatsoever in handling such a large force in the field. Experience from the Boer War was of little use, as officers with command experience from that war were now commanding larger units than they had before. Given the lack of time for reflection, it should be no surprise there was little change in opinions. Artillery still focused on supporting the infantry and cavalry (the combat branches), as it would throughout the war. Some of the most outdated views were abandoned. Artillery was no longer viewed as just more infantry firepower, and direct fire was quietly dropped. But these changes were forced on the BEF, instead of being adopted voluntarily. Other problems could not be solved yet, if ever, and of course solutions were needed immediately. Quick solutions tended to be along traditional lines, and until these were exhausted few called for radical change. After all, British arms had been moderately successful in 1914, and could expect to be so again. After valiant, if not entirely successful, opening battles, the "Miracle of the Marne" started a sustained Allied counter-offensive. Even at Ypres, the Germans had thrown in their last national reserves, and the

Allies held. (Ypres is often presented as a British victory, but the French role is commonly under-reported.) While the BEF could not claim to have solved trench warfare, they had yet to really try. Until they made a serious effort, they would not know whether their methods would be successful, and there would be no change until after the attempt had been made. Under the circumstances, they evolved rather than revolutionized.

Notes:

Note 1: Thomas Pakenham, *The Boer War* (New York: Random House, 1979). [Back.](#)

Note 2: R. H. Scales Jr., "Artillery in Small Wars: The Evolution of British Artillery Doctrine, 1860-1914" (Ph.D. dissertation, Duke University, 1976), 288. For examples of earlier organizations, see B. P. Hughes, *Open Fire: Artillery Tactics from Marlborough to Wellington* (Chichester: A. Bird Publications, 1983), 28, 143. [Back.](#)

Note 3: Sir Charles Callwell and Sir John Headlam, *The History of the Royal Artillery from the Indian Mutiny to the Great War*, vol. II (Woolwich: RAI, 1937), 133. Hereafter cited as Headlam, *History*. [Back.](#)

Note 4: For details see Anon., "Record of Work Carried out by the Artillery Branch of the Head-Quarters Staff, South African War, 1899-1902," *Proceedings of the Royal Artillery Institution* (hereafter PRAI) 30:7-9 (1904): 306-12. [Back.](#)

Note 5: The RGA (manning the heavier guns) were split up even more. E. G. Nicholls, "The training, organisation and equipment of Companies of the Royal Garrison Artillery with medium guns, and howitzers, and their tactics in future field operations," *PRAI* 28:2-3 (1902): 98. [Back.](#)

Note 6: Sir Charles Callwell and Sir John Headlam, *The History of the Royal Artillery from the Indian Mutiny to the Great War*, vol. I (Woolwich: RAI, 1931), 254-5. [Back.](#)

Note 7: Headlam, *History*, vol. II, 26. [Back.](#)

Note 8: *Ibid.*, 46. [Back.](#)

Note 9: *Ibid.*, 345-6. [Back.](#)

Note 10: W. H. F. Weber, "The Development of Mobile Artillery 1914-1918," *Journal of the Royal United Services Institute* 64:453 (1919): 50 (hereafter cited as Weber, "Mobile Artillery"). [Back.](#)

Note 11: Headlam, *History*, vol. II, 53. [Back.](#)

Note 12: See P. A. Towle, "The Influence of the Russo-Japanese War on British Military and Naval Thought" (Ph. D. dissertation, University of London, 1973), and articles in the *Journal of the Royal Artillery* (henceforth *JRA*). [Back.](#)

Note 13: R. G. Cherry, "Notes on the Battle of Liao-Yong August 25th-September 5th 1904," *JRA* 38 (1912): 502-508; Cherry, "Russo-Japanese War: The Employment of Field Artillery from June to October 1904," *JRA* 39 (1913): 152-60; Cherry, "Synopsis of the Battle of the Sha-Ho, October 1904," *JRA* 40 (1914): 385-400; Cherry, "Strategic Problems of Bohemia, 1866 and Manchuria, 1904 Compared," *JRA* 41 (1915): 362-72; M. Crofton, "A Day with a Japanese Field Battery," *JRA* 41 (1914): 611-16; G. B. Pollard, "Field Artillery in the Russo-Japanese War," (abridged and translated from the *Journal des Sciences Militaires*) *JRA* 41 (1914): 656-61. [Back.](#)

Note 14: Shelford Bidwell and Dominick Graham, *Firepower: British Army Weapons and Theories of War 1904-1945* (London: Allen & Unwin, 1982), 27. [Back.](#)

Note 15: *Field Service Regulations 1909* (London: HMSO, 1909), 135 (henceforth FSR 1909). [Back.](#)

Note 16: H. A. Bethell, "Artillery in the attack and defence of positions," *JRA* 33:2 (1906): 61. [Back.](#)

Note 17: *FSR 1909*, 134. [Back.](#)

Note 18: Headlam, *History*, vol. II, 196. [Back.](#)

Note 19: *Ibid.*, 24. [Back.](#)

Note 20: *Field Artillery Training 1902* (Amended Edition 1904) (London: HMSO, 1904), 3-4. Hereafter, *FAT*, with year thus: *FAT 1904*. [Back.](#)

Note 21: Headlam, *History*, vol. II, 69. [Back.](#)

Note 22: Bidwell and Graham, *Firepower*, 42. [Back.](#)

Note 23: Headlam, *History*, vol. II, 133, 134. [Back.](#)

Note 24: *Ibid.*, 135. [Back.](#)

Note 25: *FAT 1912*, 9. [Back.](#)

Note 26: F. R. Bingham, "Practice Camps, 1912, and the lessons to be learned from them," *JRA* 39:11 (1913): 436; *Field Artillery Training (Provisional) 1912*, (London: HMSO, 1912), 19. Even brigades only worked together eighteen days per year (18). [Back.](#)

Note 27: See, for example W. H. F. Weber, "Some notes and suggestions on the control of Divisional Artillery in, or for, the battle," *JRA* 38:10 (1912): 417-35 and "A Divisional Artillery Staff in the Field," *JRA* 37:10 (1911): 409-19; C. Holmes Wilson, "Artillery 'Sous La Main,'" *United Services Magazine* 41:979 (new series) (1905): 329-32; C. E. D. Budworth, "Artillery in Co-operation with Infantry," *JRA* 37:1 (1910): 1-14. [Back.](#)

Note 28: H. A. Bethell, *Modern Artillery in the Field: A Description of the Artillery of the Field Army, and the Principles and Methods of its Employment* (London: Macmillan, 1911), 224-6. The CRA was allowed to command if the unexpected happened and fighting became static. Bethell's book was essentially a more readable version of *FAT*, also containing clear hints of what *FAT* "really meant" and written to appeal to a wider audience. [Back.](#)

Note 29: *FAT 1914* (London: HMSO, 1914), 240-44; Weber, "Notes and suggestions," 428. [Back.](#)

Note 30: Weber, "Notes and suggestions," 215. [Back.](#)

Note 31: Weber, "Divisional Artillery Staff," 413. [Back.](#)

Note 32: H. G. Lloyd, "Methods of Controlling the fire of an Artillery Brigade," *JRA* 32:7 (1906): 313-4. [Back.](#)

Note 33: Plate III in R. E. Priestley, *The Signal Service in the European War of 1914 to 1918 (France)* (Chatham: Royal Engineers Institution, 1921) shows just such an arrangement during the fighting on the Aisne. [Back.](#)

Note 34: *Ibid.*, 499. [Back.](#)

Note 35: S. C. M. Archibald Papers, Imperial War Museum (henceforth IWM), 61. It was not Archibald but his battery commander who liked small units. [Back.](#)

Note 36: H. C. Williams-Wynn, "The Brigade System in the Royal Field Artillery," *JRA* 32:1 (1905): 17. [Back.](#)

Note 37: Headlam, *History*, vol. II, 226. [Back.](#)

Note 38: Budworth, "Co-operation with Infantry," 10. [Back.](#)

Note 39: Headlam, *History*, vol. II, 168. [Back.](#)

Note 40: J. F. Cadell, "The Organization of Field Artillery", *PRAI* 31:9 (1905): 348. [Back.](#)

Note 41: *FAT 1914*, 260. [Back.](#)

Note 42: Even this had exceptions, since *FAT 1912* and *FAT 1914* held that even 60 pounders—which lacked gun shields—could be used in direct fire. *FAT 1912*, 220; *FAT 1914*, 229. [Back.](#)

Note 43: F. R. Bingham, "Lessons to be Learnt from the 1913 Practice Camps," *JRA* 50:11 (1914): 488. [Back.](#)

Note 44: *FAT 1914*, 175; emphasis in original. [Back.](#)

Note 45: Budworth, "Co-operation with Infantry," 2, 9; *FAT 1914*, 252, 259. Budworth later served as artillery commander for Rawlinson's Fourth Army from May 1916 until the Armistice. One point should be clarified: "moral" was generally pronounced in the French style and meant the same as the modern spelling of "morale." [Back.](#)

Note 46: Headlam, *History*, vol. II, 156, 170. [Back.](#)

Note 47: See *FSR 1909*, 105-6 and *FAT 1914*, 145-49 and 154-76. Bidwell and Graham in *Firepower* cover the infantry-centered nature of British tactics in Chapters 1 and 2. I believe they under-estimate the amount to which the artillery had a doctrine of absolute subordination to the infantry's wishes. [Back.](#)

Note 48: J. B. A. Bailey, *Field Artillery and Firepower* (Oxford: Military Press, 1989), 121. [Back.](#)

Note 49: Bidwell and Graham, *Firepower*, 10. [Back.](#)

Note 50: Bethell, *Modern Artillery*, 270. [Back.](#)

Note 51: J. P. Du Cane, "Cover and Co-operation," *PRAI* 30:10 (1904): 361; C. E. Callwell, "The use of Heavy Guns in the field in Europe," *PRAI* 31:1(1904): 8. Both were brevet lieutenant colonels and future major-generals. [Back.](#)

Note 52: *FAT 1914*, 232; emphasis in original. [Back.](#)

Note 53: Bingham, "1913 Practice Camps," 499. [Back.](#)

Note 54: Bethell, *Modern Artillery*, 138. He disagreed with the manuals and thought infantry could work up to 100 yards from the target with gunfire and 50 yards with howitzer fire (139). [Back.](#)

Note 55: Much of this section was drawn straight from *FAT 1914* and Bethell. [Back.](#)

Note 56: Bethell, *Modern Artillery*, 142-3. Bethell might have done well at Sedan with such tactics, but not in South Africa. Bethell had retired by 1914 but was "dug-out" and trained 25 Division's artillery until it went abroad in June 1916. [Back.](#)

Note 57: *Ibid.*, 270. [Back.](#)

Note 58: Bingham, "1913 Practice Camps," 488. [Back.](#)

Note 59: *FAT 1914*, 296-7. [Back.](#)

Note 60: Ibid., 297. [Back.](#)

Note 61: Bethell, *Modern Artillery*, 325. However, counter-battery work could still present a direct-fire problem. F. D. V. Wing, "The necessity for a High Explosive Shell for Field Artillery," *JRA* 33:6 (1907): 271-3. [Back.](#)

Note 62: *Field Artillery Training 1906* (London: HMSO, 1906), 109, 141. [Back.](#)

Note 63: Headlam, *History*, vol. II, 115. Adding phosphorous to produce a puff of smoke and make it easier to spot the exploding shells had been ruled illegal by unnamed higher authority for potentially violating international agreements on poisonous weapons. Naturally, once toxic gasses were used in the war qualms about a little bit of phosphorous vanished. [Back.](#)

Note 64: Ibid., 113-4. [Back.](#)

Note 65: L. A. Hawes Papers, IWM, 22. [Back.](#)

Note 66: Bingham, "1913 Practice Camps," 495, 501. [Back.](#)

Note 67: *Garrison Artillery Training 1914* (London: HMSO, 1914) (hereafter GAT 1914) vol. II, 1; *Field Service Pocket Book 1916* (London: HMSO, 1916), 8-10, 39-40. [Back.](#)

Note 68: Headlam, *History*, vol. II, 227. [Back.](#)

Note 69: A. H. Webb, "Duties of a Heavy Artillery Brigade Commander in the Field," *JRA* 46:10 (1918): 447. Webb was one of the battery commanders. [Back.](#)

Note 70: Headlam, *History*, vol. II, 249. [Back.](#)

Note 71: Headlam, *History*, vol. II, 255. This was in 1906; shrapnel was being phased out of use by siege artillery by 1914. [Back.](#)

Note 72: H. C. C. D. Simpson, "The Future Role and Organisation of our Siege Artillery in War," *JRA* 32:9 (1906): 385-91. [Back.](#)

Note 73: *GAT 1914*, vol. II, 144. [Back.](#)

Note 74: A. F. Brooke, "The Evolution of Artillery in the Great War," *JRA* 51:5 (1925): 256-7. [Back.](#)

Note 75: Weber, "Notes and suggestions," 422. [Back.](#)

Note 76: Bethell, *Modern Artillery*, 343, 226. [Back.](#)

Note 77: Ibid., 343. [Back.](#)

Note 78: S. W. H. Rawlins, *A History of the Development of the British Artillery in France 1914-1918*, in Rawlins Papers, RAI MD 1162, 1 [Back.](#)

Note 79: It is entirely possible, but not clear from the records, that some officers were informally notified that on mobilization they would be AAs. [Back.](#)

Note 80: H. W. Wynter, "Higher Artillery Command in War," *JRA* 40:2 (1912): 57-68. [Back.](#)

Note 81: The requests are inferred; no messages have been found in the records, but the arrival of the 6-inch howitzers in France in the second week of September strongly suggests the BEF requested them, and it is clear that the request was made in the earliest days of the war. [Back.](#)

Note 82: Sir James Edmonds, compiler, *History of the Great War Based on Official Documents by Direction of the Historical Section of the Committee of Imperial Defence: Military Operations France and Belgium, 1914*, vol. 1 (London: Macmillan 1922), 102, 106, 310, 318-9, 323. (Hereafter referred to as *OH*, with year and volume number, thus: *OH 1914*, vol. 1). [Back.](#)

Note 83: *Ibid.*, 134, 186. [Back.](#)

Note 84: Shelford Bidwell, *Gunners at War: A Tactical Study of the Royal Artillery in the Twentieth Century* (London: Arms and Armour Press, 1970), 17-19. [Back.](#)

Note 85: S. C. M. Archibald papers, IWM. [Back.](#)

Note 86: *OH 1914*, vol. 2, 134. [Back.](#)

Note 87: Brooke, "Evolution," 261. [Back.](#)

Note 88: 4th Division Operation Order No. 12, 18 December 1914, Field-Marshal Sir Archibald Montgomery-Massingberd Papers, Little Hart Centre for Military Archives, King's College London, (henceforth LHC), file 5/1. [Back.](#)

Note 89: *OH 1914* vol. 1, 419. [Back.](#)

Note 90: *Ibid.*, 451. [Back.](#)

Note 91: *OH 1914*, vol. 2, 82. [Back.](#)

Note 92: "Operations of the 1st Corps on the River Aisne, 13th September to 30th September 1914" (hereafter "Operations of the 1st Corps, Aisne"), Field-Marshal Baron Horne of Stirkoke Papers, IWM. [Back.](#)

Note 93: *OH 1914*, vol. 2, 336. [Back.](#)

Note 94: *Ibid.*, 272. [Back.](#)

Note 95: *Ibid.*, 249, 227. [Back.](#)

Note 96: "Notes on Artillery in the Present War," 2 October 1914, G. Helps Papers, IWM. [Back.](#)

Note 97: "3rd Army Corps Tactical Notes," c. September-October 1914, Montgomery-Massingberd Papers, file 5/1. [Back.](#)

Note 98: *OH 1914*, vol. 2, 165, 274, 338, 408. [Back.](#)

Note 99: *Ibid.*, 206. [Back.](#)

Note 100: *Ibid.*, 263. [Back.](#)

Note 101: "Further Notes on Artillery in the Present War," November 1914, Helps Papers, IWM. [Back.](#)

Note 102: Horne at one point acted as replacement for a CRA rather than as Artillery Adviser. "Operations of the 1st Corps, Aisne." [Back.](#)

Note 103: A. H. Hussey, *The War Diary of Brig. Gen. AH Hussey, RA, 1914-1918*, Royal Artillery Institution Military Document 1175, 18-19 December 1914. [Back.](#)

Note 104: *OH 1915*, vol. 1, 18. [Back.](#)

Note 105: See also Bidwell and Graham, *Firepower*, 100. [Back.](#)

Note 106: "3rd Corps Tactical Notes." [Back.](#)

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