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Was World War I fought in the best way possible? The casualty totals show that the combatant armies and nations fought hard, but they have also been used as evidence that it was not fought well at all. At the time these figures did not look so bad: censorship, deferential societies, and a shared win-the-war spirit all helped mask the problems. Two other points are sometimes lost. For all the accusations of incompetence—of being butchers or bunglers—leveled at First World War generals, they were not trying to do badly; moreover, critics often lose sight of the rapid pace of change during the war, as new ideas were tried and accepted, modified, or rejected. A more difficult charge is that the war was not fought as well as possible, not in a "modern" way. Critics have offered a number of suggestions, but a common theme is that more materiel and technology should have been used instead of manpower. This would have meant more tanks, more aircraft, and more poison gas, but mainly more artillery.

Artillery dominated World War I. Photographs, memoirs, poetry, and prose all show the different effects of shellfire. High explosives and shrapnel bent steel, ripped flesh, and cratered the ground. While man has memorialized the war, nature still has not mended the damage, and French and Belgian farmers still reap their steel harvest. But what drove the artillery? How was it used? Was it used effectively? As effectively as possible? Who decided how to use it? Was it well integrated into the army? How did these issues change over time?

Elements of Battle

Throughout history warfare has depended on fire, movement, and morale. These elements are linked: covering fire makes movement possible, and mobility brings firepower to bear on critical points; morale carries troops through the fire-swept zone or keeps them fighting when all seems lost. For millennia, weapons and mobility were both muscle-powered, with little that was more powerful than bows and nothing faster than horses. The introduction of gunpowder revolutionized tactics but not strategy. While the chemical energy in gunpowder increased the range and power of weapons, it had no effect on mobility. Infantrymen carried their arquebuses, muskets, or rifles, and horses still pulled guns and wagons. After gunpowder there were evolutionary technical improvements, but for generations warfare changed little. With minimal study, Oliver Cromwell could have won battles in the 1630s. But from that time on, the pace of technical change increased with every year, and especially with every war.

The Western Front of the First World War is notorious for fire without movement. World War I happened at a moment of technical imbalance. Nineteenth-century discoveries had multiplied firepower but not tactical mobility. Rifling had increased the range and accuracy of small arms and artillery; more powerful and smokeless powders provided still longer range and also greater lethality for artillery; precision machine tools yielded machine-guns that would multiply infantry firepower. Better technology and improved agricultural practices increased the food supply and the population, and also allowed more farm boys to be taken into the army. The railroads could move the larger armies and their supplies from the homeland to near the fighting front faster than ever before. But between the railhead and the front lines, armies were as reliant on muscle-power as the Romans. Immense effort went into squaring this circle. Scientists and engineers tried as hard as possible, but the vital factor—the internal combustion engine—would not bear full fruit until after World War I. Yet there was a war to win right now—in 1914, 1915, 1916, 1917, and 1918—and generals had to make the best of the materials at hand. They eagerly grabbed whatever solutions technology seemed to offer, but they could not wait for technological solutions that might or might not occur according to the schedule that the scientists promised. As a

result, they changed how their armies fought. Another way of putting it is that they altered tactical and operational methods.

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In previous wars, when tactical movement had been stymied by firepower, generals had been able to maneuver strategically. For example, in the 1864-65 Overland Campaign of the American Civil War, Ulysses Grant moved to the flank and levered Robert E. Lee from every position Lee occupied rather than simply attacking head-on. His few frontal attacks were costly and only encouraged further maneuver. But by 1914, demographics and the willingness of politicians to put very large percentages of their nations' young men in uniform produced armies so large that battle-lines reached across continents. Armies now had to fight battles just to get the space to maneuver; winning strategic maneuvering room required effective tactics, the inverse of pre-war teaching. Fire, movement, and morale became the keys. The movements of infantrymen—small unit tactics—became the limiting factor of armies and of nations. Tactical movement helped move infantry firepower to where it was needed, but the infantry did not have enough firepower to solve their tactical problems. Infantry firepower increased, with light machine-guns, automatic rifles, hand- and rifle-grenades, flame-throwers, and light mortars being invented or widely distributed (or sometimes both). But men could not rival machines in producing firepower. Infantry units did not have enough firepower or mobility to capture a position held by equally well-armed opponents, even if the attackers had a substantial numerical advantage. Infantry firepower and tactics would not be enough to break the deadlock.

Morale was not as important as anticipated in World War I. Nobody had foreseen that morale was more than just a battlefield phenomenon: it was now national morale, the combined will of a people to win a war. Troops might become demoralized in battle, individuals and small groups might surrender rather than fight to the death, but rest revived a unit's flagging spirits. Armies were so large that it took repeated and consistent defeats to even begin to shake morale. Even an army as motley and unsuccessful as that of Austria-Hungary did not dissolve until well after defeat was obvious on the battlefield, on the home front, and at the conference table. Not until national victory appeared out of reach would morale truly crack.

Generals were left, through a process of elimination, with firepower as the one variable they could use to shape the course of battles, and artillery generated the bulk of firepower. This surprised the artillery as much as anyone. Pre-war armies had all stressed the primacy of infantry and cavalry, and had generated enough firepower to solve tactical problems by using more infantrymen or tactical infantry maneuvers. The problems for both infantry and artillery had been glossed over, bypassed on paper as they were to have been on the battlefield. Officers assumed that if an advance were stopped in one place that success somewhere else on the battlefield (or units outflanking the geographically limited battle) would solve the problem and restore strategic mobility. Nobody studied how to attack a fortified or entrenched position where firepower was the key. (There were a few, especially in Germany, who studied siege warfare, but they did not envision the scale it would take in World War I.) From 1914 on, armies could no longer dismiss the problem of frontal attacks and had to devise new tactics. These quickly centered around the use of artillery because, even though few officers were analyzing problems in terms of firepower and mobility, only the artillery could provide enough firepower to address the problem.

To confuse matters, the details of the tactical challenge—although not its fundamental nature—changed throughout the war. Trench warfare is more static in contemporary minds than it actually was during World War I. Failure, and frequently even success, caused a search for improved methods. These might be as simple as more spade work or as complex as a complete overhaul of defensive doctrine. Thus an attack in 1916 might have been good enough to overcome 1915-era defenses but failed against the defenses of 1916. By 1917, as military leaders grew more studious, there were more lessons learned from success. It was no longer enough simply to repeat a successful formula; the reasons for

success had to be understood and applied to what were coming to be recognized as different circumstances.

The task of the defenders was simpler than that of the attackers: to halt an attack they only needed to disrupt the attacker's combination of fire and movement. If the defenders had an edge in firepower or morale, it was almost certainly enough to win the battle. An attack without enough firepower was already in trouble, but plenty of fire support did not guarantee success. Co-ordination was the weak link. Thanks to a technological missing link, World War I was the only major war fought where generals lacked voice command. In earlier wars commanders led in person, and in later conflicts voice radio would link units. But during the war years, rigid planning had to replace on-the-spot changes of plan. Locked into a plan, the attackers were vulnerable to defensive firepower and movement. Defensive firepower could nullify either offensive fire or movement, or the defenders could disrupt the attackers' plans with two mobility options of their own—either through a counter-attack or posing obstacles to the attacker's movement (typically barbed wire). This was not the end of the chess match, and the attacker had three options to preempt these defensive plans: apply overwhelming firepower to cancel defensive mobility, firepower, and obstacles; give the attacking infantry more firepower; or find some way of improving communications. All these factors went into the analysis of move, counter move, and anticipated moves, but in war, unlike chess, lives are lost instead of pieces.

Focus of the Study

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This study primarily examines the British and Dominion forces operating on the Western Front. While some of the broader comments about what artillerymen thought in general may well be true for other armies during the war, the focus here is on the British. The focus on the Western Front is deliberate: that was where the war would be won or lost, that is where tactical developments were most marked, and that is where artillery made the most difference.

Beyond the Western Front, change was slower in coming, not because officers were duller but conditions were different. East African operations were more reminiscent of nineteenth-century colonial wars: terrain and disease were greater impediments than German firepower. Black-powder rifles were still common, and the British army was not challenged to solve tactical problems as complex as those faced on the Western Front. Elsewhere, the Turks proved themselves to be dogged fighters, but their technology, tactics, and commanders were not as sophisticated as those of the Germans. In Mesopotamia or Palestine, the British could usually solve a problem by simply using more artillery, so any improvements in technique were simply a bonus. Thus Allenby's attacks in 1918 were successful despite being outmoded for conditions on the Western Front. ¹ The British troops "gardening" at Salonika fought relatively little, their operations being stymied by the lack of support provided to the low-priority campaign. The divisions sent to Italy to face the Austrians came from the Western Front, were equipped to Western Front standards, successfully used Western Front methods, and reported that the Austrians were not as skilled as the Germans. But on the Western Front the Germans did not sit still. Their technical skill and military professionalism drove the Allies to ever better methods. When in 1918 the Americans tried tactics reminiscent of 1916, or even 1915, they suffered severely. So the British dominance over the Germans in 1918 showed that the Royal Artillery was perhaps the best in the world, having been driven by an immense challenge.

Not all aspects of artillery will be covered. The goal of this study is to see how tactical and operational changes did or did not affect strategy. Anti-aircraft guns, for example, had no effect on this. While the Royal Artillery did man some trench mortars, mortars played a role that was only peripheral to the majority of artillery work, and to operational and strategic planning. Of course, in all of its operational improvements the Royal Artillery was ably and quietly supported by many other organizations. Guns and shells had to be designed,

manufactured, shipped to France, and delivered to the front. Naming only the most obvious, this involved designers, engineers, labor unions, railroads, the Royal Navy, merchant sailors, stevedores, and the Army Service Corps. Beyond these, the Army Ordnance Department repaired guns, and the Royal Engineers and Royal Flying Corps contributed in many ways. These were all quietly crucial roles but generally were "dogs that did not bark," potential rather than actual problems. These various groups usually played their roles successfully; when they could not or did not, the results were instantly obvious at the front line. Frequently it was improvements by someone else that allowed the artillery to improve in turn. It would take too much space to trace developments throughout the entire supply chain; in general, their role will be explained if they affected artillery operations and doctrine. For the flying services, adequate expression of the scope of their support for the artillery is hardly possible. From the first days of the war the two worked as closely as the limits of technology permitted. By war's end, virtually all artillery work involved some measure of RAF help, aid so often purchased with valiant lives under the guns of the Red Baron.

Two Schools of Thought?

The tremendous human toll of World War I has prompted much of the study of the strategies involved. Historians have sorted the generals into two broad categories based on their strategic thinking. Many generals sought a breakthrough, thought morale was the factor that won battles, and that cavalry would tip the scales of victory. Others planned to wear the enemy down through limited victories, using firepower rather than manpower, relying more on the technical arms of the armed forces such as the artillery and engineers. Because more generals tried for breakthrough victories, we have evidence of how that theory worked, which leaves the field open for speculation that the second system would have been better. During the war some officers did—at least sometimes—lean towards the second (and completely different) model of fighting the war. Among these were James Edmonds (later the British official historian) and two army commanders, Herbert Plumer and Henry Rawlinson. Yet historians who suggest that the British army should have fundamentally re-cast the way it fought tend to assume that the technical arms wanted such a change. Regardless of what other groups may have wanted, the artillery did not.

Artillery officers believed their correct position was subordinate to the combined-arms commander and the general staff, because those men had to balance all facets of operations. Commanders and staff officers should not have a narrow perspective, whether it be of the infantry or artillery or cavalry or engineers. But even though they accepted someone else having the final decision, artillerymen demanded to be heard during the planning stages. If overruled, they loyally obeyed and did their best to make the plan work. So, strange as it seems, some of the most imaginative artillery plans were not actually conceived by gunners.

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Most gunners were pragmatists, not revolutionaries or reactionaries. They accepted their subordinate role, and most rejected the ideas expounded by so many historians that artillery (and technology) should have been the centerpiece of operations. The gunners quietly and constantly improved their arm so that they could help the combat arms in more and better ways. And, by the end of the war, the incremental, evolutionary steps they had encouraged and embraced added up to a revolution. Ironically, in some ways because this was not a conscious revolution, when it occurred it was accepted without inspiring a group of counter-revolutionaries.

Why not Revolutionaries?

In some ways it is surprising that artillerymen, technically trained before a war that was increasingly technical, did not argue for a more technical—or more "modern"—and less psychologically- or morale-based style of warfare. Some did urge technical solutions,

especially when approaching formal siege operations. But most artillery officers accepted without visible qualms the dominant consensus of the British army, which held that, assuming a reasonable balance of technology, morale won battles. Even those who advocated a more "modern" style offered debating points rather than a fully developed doctrine, and rejoined the consensus when their ideas were either overruled or fell by the wayside.

It is important to understand why artillerymen were so willing to be part of the consensus. In part it was due to promotion patterns in the artillery. Promotion was slow, taking roughly thirteen years to rise from second lieutenant to captain, and another decade to become a major and command a battery. That gave time for even the most radical officers to be absorbed into the common ethos—or quit in frustration. Also, officers from the Royal Horse and Field Artillery dominated the higher ranks, rather than the more technically trained Royal Garrison Artillery. Garrison gunners had the least contact with other arms—coastal artillery hardly involved combined arms tactics—and the fewest opportunities for the accelerated promotion that came through campaigning. Pre-war critics said the Garrison artillerymen knew too little of combined arms tactics; post-war critics said the other artillerymen did not know enough technical gunnery. Even during the war, there was plenty of criticism, especially of horse gunners, for not understanding gunnery. They did learn, and complaints died away. From early 1917, RGA men earned more of the senior artillery posts, but they still caused no great change in the style of operations.

It is also important to recall that it was a more deferential age. Senior figures in all walks of life were questioned less. Officers below the rank of major were simply not encouraged to think independently. Without impugning the many intelligent and thoughtful officers, the British army was not an intellectual place. Pig-sticking, polo, and horse races were more important to many officers than professional study. There was some reverse snobbery against those who studied too hard, although it seems to have been mild. But there was no advanced schooling (beyond combat experience) for officers in the artillery. Artillery officers were certainly accepted at the Staff College, and some went into positions with the Board of Ordnance, but there was no mid-career professional education for the bulk of officers. Perhaps the exemplar of these officers was A. E. Wardrop, whose two publications were the decidedly untechnical *Modern Pig-Sticking* and *Days and Nights with Indian Big Game*, yet he did a thoroughly competent job as a corps artillery commander from 1916 to 1918 and as Major-General, Royal Artillery of the Third Army during the offensives in 1918. ²

Two other factors should also be taken into account: the success of the traditional view, and recent changes in the army. The traditional ways were time-tested, and appealed to innately conservative men. This is not the place to examine the political and social views of the Edwardian professional army, but they can briefly and fairly summarized as not radical. Before 1914, the changes in both weapons and tactics after the 1899-1902 Boer War also served as a lightning rod. Conservatives said these changes had solved the problems that had been made manifest in that war and that there was no reason to pursue further reforms without evidence of new problems. Proponents of further change had to bide their time. Of course, in all this internal discussion, nobody was planning for a war that would start on 5 August 1914.

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Thus, the British Expeditionary Force started the war with most traditional ideas intact, and went from 1914 until late 1917 making steady incremental improvements; these improvements would prepare the way for dramatic changes. By late 1917, the army understood the details of fighting, and high-ranking officers had the experience that let them turn the generalities and the timeless fundamentals of war in *Field Service Regulations* into operational and strategic plans. Artillerymen were part of this shift. They not only had to learn their capabilities and limitations, but also had to get their ideas across to the rest of the army. This posed a problem, not because other officers were ignoring the artillery, but because of their lower level of understanding of technical problems and of

military matters in general. By 1917, a pre-war infantry captain stood an excellent chance of being either dead, discharged for wounds, or a colonel. Yet while those colonels had plenty of combat experience, they had not been through much formal military education. Like the trenches in which they fought, these captains-cum-colonels' knowledge was deep but their horizons were narrow, and one of the major objectives for training in 1918 (and planned to continue in 1919) was broadening those horizons. In some ways, the ending of the fighting in 1918 stopped that education and halted the changes in army doctrine.

Source Material

There is a wide array of source material about the Royal Artillery. War diaries are essential, containing a range of information available nowhere else. They contain the orders typed and mimeographed, reports of what actually happened, and frequently message logs as well. Analytical reports are also often included. All available war diaries for corps artillery commanders were examined for this study, allowing comparison between different commanders and organizations. ³ Some divisional diaries were examined when they were vital for operations by a larger formation. Compared with infantry diaries, artillery diaries are fuller and more continuous. This simply reflects the different conditions the writers experienced: the officer keeping an infantry unit's diary was far more likely to become a casualty than his opposite number in the artillery. Artillery headquarters moved less often and had greater facilities to preserve relevant papers. However, army and GHQ artillery officers did not keep war diaries, and their influence has to be gleaned from General Staff diaries and other official correspondence. ⁴

More of the arguments and effects of personality can be understood from private papers. Surviving papers are highly variable, from diaries only listing the day's events to voluminous correspondence including retained copies of official papers. The most useful private papers are those of the army commanders, senior artillerymen, and Field-Marshal Sir Douglas Haig himself. General Sir Henry Rawlinson, commander of Fourth Army, left considerable semi-official and private papers. General Sir Hubert Horne and General Sir Edmund Allenby of First and Third Armies have left smaller collections that still reveal some facets of their work and thoughts. Among artillerymen, General Sir Noel Birch, who rose in 1916 to GHQ, left no papers himself, but those of his right-hand man, Lieutenant Colonel Stuart Rawlins, survive, as do many of the working files kept by Birch's office. ⁵ These files survive, for no apparent reason, in the papers of Major-General Sir John Headlam, Birch's predecessor, and a man who squirreled papers away. Agendas and minutes of many official meetings, surviving nowhere other than Headlam's papers, allow a glimpse into the details of daily command. ⁶ Lieutenant-General Sir Herbert Uniacke, senior artilleryman of the Fifth Army through two years of crucial battles, also left considerable private and official papers. ⁷ Other less senior artillerymen left diaries and papers which in the aggregate are useful but are often individually unrevealing except for detail and anecdote. ⁸ Those commanders who were imaginative and aggressive, as reflected in their private papers, did tend to be promoted.

Haig's diaries and associated papers and correspondence have already attracted considerable historical attention that need not be repeated here. Whatever alterations took place, he seems not to have altered his comments about artillery or artillerymen. ⁹ Two artillerymen wrote histories of the artillery in the war that remain unpublished. Stuart Rawlins was one of Birch's staff officers from 1915 onwards and, between the Armistice and the peace, took advantage of the files at his disposal at GHQ. (Where these were inadequate he shamelessly used his official position to get material from subordinate headquarters.) He wrote a dry staff history, carefully omitting names of guilty and innocent alike. Edgar Anstey wrote a livelier and more readable history, quoting from private letters (which have now disappeared) entrusted to him; his work, which reached the state of galley proofs, served as the basis for Sir Martin Farndale's volume of the regimental history. The Official History is

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intermittently useful. Written largely to show the bravery of the infantry, it generally avoids operational and strategic analysis. Yet the detailed history does mention many times the low-level effects of artillery, and the appendices contain numerous useful documents.

Official training and tactical books and pamphlets provide an excellent guide to how quickly ideas were adopted and disseminated, but do not pin down precisely when the idea sprang up. An idea must have existed before being spread, but there is no way to tell how much earlier. The Imperial War Museum has the best collection of such material, not only regulations and training volumes but also an excellent collection of doctrinal, training, and informational pamphlets produced during the war. These reported the army's latest experiences and disseminated changes with the least delay.

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Of course, a pinch of skepticism needs to be used when reading any official papers. Not all units could reach the official standard, while some felt their way was better and ignored the official methods. Also, if events had developed according to orders, the war would have been won in 1914; orders need to be read with a grain of salt and an eye on what really happened. Regardless of the "friction" of events, the official papers are a vital source for how the BEF wanted to fight the war.

Other Technical Branches

Historians have described two schools of thought within the BEF, one centering on the human aspects of battle, the other taking a more technical approach. This study will show that the artillerymen agreed with the "human battlefield" school, and believed the artillery was a supporting arm. But were the gunners alone in their views of their role within the army? There were several other technical branches of the armed service whose views can be no more than sketched here, and which are worthy of fuller inquiry. The Royal Engineers, the air forces of the Royal Flying Corps and the Royal Naval Air Service (merged into the Royal Air Force on 1 April, 1918), and the Tank Corps were all technical arms. According to the unspoken thesis of many historians, they should all have wished to fight World War I in a more technical style.

The engineers showed some inclination to do so, with some officers suggesting that the war should be conducted as if it were a huge siege. One of the main proponents of this approach, James Edmonds, later compiled the Official History and may have used this platform to exaggerate this viewpoint within the Royal Engineers. Certainly the Royal Engineers had even more technical innovations to cope with than the artillery. Most new developments first went to the engineers before being assigned to someone else. Signals is an example: telephones were first maintained and operated by the Royal Engineers before that function was passed to the Royal Signal Corps. The role of Engineer Adviser at the corps level and above did evolve into Engineer-in-Chief, while the senior gunner was never Artilleryman-in-Chief. Yet the authority of the Engineer-in-Chief ran only to purely engineer matters, and the sappers fitted themselves into larger plans.

Air forces are almost uniquely technical—they need technology to stay aloft, let alone fight. Air power theory developed rapidly during the First World War, and with astounding speed afterwards, and by the 1920s visionaries argued that armies and navies were redundant. Yet during the war the RFC waged an aggressive campaign based on morale, viewing its aeroplanes as mere vehicles for the men in them, men whose morale was still crucial. Although the air forces were reorganized into a third service in 1918, the reasons were largely political (defending Britain against German bombers and retaliating against Germany) rather than pressure from the forces in France for a more centralized organization.

The Tank Corps has attracted enormous attention. With the example of World War II tank

forces in view, it seems obvious that the First World War was botched. In 1918, tank visionaries were suggesting a completely different way of fighting for 1919. The plan fortunately stayed on paper: tanks of this era could not do what the plan imagined, nor could industry build the number of vehicles forecast, nor could the army man them. In World War I tanks, used properly, helped the infantry, often in ways out of proportion to the small numbers and limited mechanical capabilities of the tanks. Yet historians of tanks often over-emphasize their wartime value in light of later developments, especially the blitzkrieg. A major difference between tanks and other weapons was one of age. Tanks were a brand-new weapon, possessing only a future; artillery was old and was comparatively well understood. Changes in artillery weapons and techniques were slower because of the mass of men who had to be re-trained; even in 1918, the Tank Corps was only 11,000 men, so changes could spread faster than through the BEF's 500,000 gunners.

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Moreover, brand-new weapons not only offer new ways of operating, they seem to require them, along with rapid revisions of those new tactics. Meanwhile, changes in an established arm are less likely to attract attention simply because it is established; people are liable to believe they understand the older things or get distracted by the new. Finally, people involved in anything new tend to be possessed of a certain amount of self-promotion. The enthusiasts around the new wonder weapons were simultaneously convinced they were right and concerned that they would be ignored.

A Combat Arm?

In attempting to decide whether the BEF should have changed their style of fighting, it is important to consider whether artillery is a combat arm or a combat-support arm. This argument still runs today, as the artillery are often the only troops engaging the enemy, but not in direct contact with them. Artillery generals can explain plans on a map, saying "and now the gunners are attacking the enemy here, then we attack them there, now shifting our attack there." The converse argument is that the artillerymen are not physically part of the attack, only their projectiles. Shellfire may well suppress an enemy, but it never captures a position—it just makes the eventual attack easier for the infantry, tanks, or cavalry. Similarly, just as tanks may roll over a feature, the infantry (albeit properly supported) still have to hold it. Today this argument is mainly for the honor of the troops involved, but its antecedent was in many minds during World War I.

The debate about whether the artillery was a combat or supporting arm had been heavily influenced by the Boer War. Without going into great detail, the Royal Artillery's ideas of how to fight a European war were demolished by their poor performance against the Boers. They had gone to South Africa, applied their doctrine for a Continental war rather than a colonial war, and failed. The artillery, after a string of failures in battle, managed to support the infantry but had failed to affect battles on its own. With big-war doctrine out the window, the experience gained in the countless minor skirmishes and colonial campaigns counted for more. Yet the "small wars" experience distorted the value of firepower. Typically, the British faced an irregular opponent, or even full-blown guerrillas. Capturing ground was not the yardstick of victory because it did not affect the enemy's willingness to continue fighting. What mattered more were the casualties inflicted. Thus the artillery became even more devoted to shrapnel—very good at inflicting casualties—and shied away from high explosives, which did more to demoralize the recipients. Artillery operations drifted towards destruction, not neutralization, and of personnel, not materiel. Why this did not affect other doctrine and thinking towards destruction and attrition is unclear, but it cannot be pursued fully here.

This distorted many soldiers' views of artillery, including the gunners' own view. Artillery firing shrapnel was simply a different kind of infantry firepower: artillery pieces were used in direct fire to essentially fire hundreds of small bullets. Guns had a greater range than rifles, and could engage enemy artillery, but there was no reason they should not go in harm's

way. Viewed in this manner, it was an entirely appropriate question whether guns should be up alongside the infantry firing line. The infantry liked having their supporting artillery in sight and in shouting distance, which brings up another advantage of deploying the artillery forward: it made for better communications on the battlefield. The infantry did not feel themselves alone, and the gunners could take pride in playing their traditional role and have the honor of combat.

But South Africa had forced the separation of infantry and artillery. Artillery simply could not work effectively under long-range rifle fire. Under Mauser fire, infantry had it bad, but the gunners had it worse, having to stand up and walk around without even a gunshield to protect them. They could not "hit the dirt" the way the infantry could, or move from cover to cover.

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Despite this shattering of preconceptions, within a few months the artillery were again delivering effective support, albeit now from a distance. They accepted this change with remarkable grace considering it was the rejection of all their previous doctrine. The *Journal of the Royal Artillery* had an annual essay contest on topics of special interest. ¹¹ In 1900 the debate was about how quick-firing guns and smokeless powder affected artillery operations; 1901's topic was heavy guns and their relevance in the field. 1902's contest posed a blunt question: did South Africa provide lessons for a European war?

The answer was yes. In "small wars" guns could still be part of the firing line, but only exceptionally would that be true against a modern European foe. There were flickers of hope for a more glamorous role for artillery, and the usual problems of implementing change (money and the confusion in people's minds) helped to partially stem the tide, but there was no gainsaying the Mauser and its effects at Colenso, where rifle fire had slaughtered gunners.

The bottom line of this debate was that nobody really doubted that the infantry and cavalry were the combat arms, with artillery and engineers supporting them. Granted, the Royal Artillery and Royal Engineers were more combatant than the Pay Corps or Ordnance Department, but they were not combat arms. When aeroplanes, gas, and tanks developed, they too were categorized as supporting arms. Given the limitations of these novel weapons, the British were right not to rely on them as equals to the infantry, but while it was ultimately sensible the attitude also slowed responses to changes within the traditional arms.

Coming from the background they did, artillery officers were not arguing for an artillery-centered style of fighting. Artillerymen did not campaign for a change in the army but accepted their role as part (perhaps the largest part) of "fire" in the "fire and movement" formula. Throughout the war, when contemplating the results of a battle and how to do better the next time, artillery officers reiterated their role as supporting the infantry. Some of the brightest did so explicitly, some implicitly, while others were not so intellectual and simply carried on doing what they had been doing.

New Ideas

How did new ideas percolate into artillery doctrine? Did this process differ for different elements of artillery work? Technical improvements, those affecting gunnery, were spotted by the chain of command, quickly adopted, and disseminated top-down. Good local innovations would be propagated as soon as they came to the attention of higher authorities. Some formations actively fostered technical innovation, harboring inventors and experimenters, but that depended on the commander's personality. In sum, where technical innovations affected only the artillery there was little hesitation in making changes; the problems came when other parties were involved. Outsiders generally needed

more time to understand what the artillery could do technically and integrate that with their own tactical changes and the changes the Germans were making. Incremental improvements were more easily adopted than bold innovations.

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Moreover, there were different dynamics affecting strategy and tactics. (The operational level of warfare had not yet been diagnosed in the British army.) Tactical alterations and innovations were encouraged, if sometimes only through benign neglect, by senior officers. Strategy was a very different matter and was subject to a great many more preconceptions and prejudices. This essentially implied a two-tier decision-making process: artillerymen were allowed their freedom on purely artillery questions, but on matters affecting combined-arms teamwork the other parties generally won the day. Strategy also intruded into tactics. Since the Allies' fixed grand strategic goal was to liberate France and defeat Germany, they had to attack. The preferred type of attack was the breakthrough, the decisive battle that would win the war sooner rather than later. Working its way downward, this preference affected tactics, forcing choices that generally undermined the chances of a limited success by striving for the great success. It was only in 1918, with an inter-Allied High Command coordinating and limiting attacks (perhaps the glimmerings of an operational level of war) that the BEF's fighting style changed to one that better suited the artillery.

Notes:

Note 1: Archibald Wavell, one of Allenby's staff officers and a future field-marshal himself, notes the lower number of guns needed in Palestine: Wavell, *The Palestine Campaigns* (London: Constable & Co., 1928), 206 and note. [Back.](#)

Note 2: A. E. Wardrop, *Modern Pig-Sticking* (London: Macmillan, 1914); *Days and Nights with Indian Big Game* (London: Macmillan, 1923). [Back.](#)

Note 3: See complete list in [Bibliography](#). [Back.](#)

Note 4: Army War Diaries are listed in the Bibliography, as are the relevant WO158 Operations files, although others were consulted. [Back.](#)

Note 5: S. W. H. Rawlins Papers, Royal Artillery Institution (hereafter RAI), military document 1162. [Back.](#)

Note 6: Sir John Headlam Papers, RAI Military Document 183. Headlam's papers also include much material from his time in command of the Second Army's artillery in 1915 as well as—again, without explanation— from the activities of the Third Army in late 1918, when Headlam was employed at the War Office. [Back.](#)

Note 7: Sir Herbert Uniacke Papers, RAI military document 1160. [Back.](#)

Note 8: E.g. A. T. Anderson Diary, RAI Military Document 1301; W. StC. Bland Papers, RAI military document 1126; J. G. Geddes, Diaries, RAI military document 1135; A. H. Hussey, RAI military document 1175; W. B. R. Sandys, Diary, RAI military document 211. More interesting, not least because the author had a more active war career and put more of himself into his diary, is Sir Hugh Tudor, Diary, RAI military document 1167. [Back.](#)

Note 9: Haig's official reports to the War Office, intended for contemporary publication and thus heavily self-censored—and at times containing blatant lies for public and German consumption—are mostly available online at www.firstworldwar.com/source/haig_despatches.htm. [Back.](#)

Note 10: E. C. Anstey Papers, RAI military document 1159; General Sir Martin Farndale, *History of the Royal Regiment of Artillery: Western Front 1914-1918* (Woolwich: RAI, 1986). [Back](#).

Note 11: "In 1905, the Proceedings were renamed *Journal of the Royal Artillery*." [Back](#).

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