Great War, Total War

COMBAT AND MOBILIZATION ON THE WESTERN FRONT, 1914–1918

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From Cabinet War to Total War

The Perspective of Military Doctrine, 1861–1918

HEW STRACHAN

Sieges were at least as important as battles in the wars fought between 1815 and 1914. The Crimean War pivoted on the siege of Sevastopol; Vicksburg was the foil to Gettysburg in the campaign of 1863; and in 1877 the Russian invasion of European Turkey was halted at Plevna. For military theorists the wars of German unification embodied the notion of decisive maneuver leading to victory on the battlefield. And yet in all three, sieges or their threat played decisive roles in the outcome. In 1864 the Prussians invested the Danes at Duppel; in 1866 they preferred to settle with the Austrians after Sadowa rather than lay siege to Vienna; and in 1870 the resistance of Metz and, above all, Paris prolonged the war and confounded Helmuth von Moltke. The two wars that immediately preceded the outbreak of World War I, both of them closely studied by European military observers, told a similar story: The siege of Port Arthur formed the centerpiece of the Russo-Japanese War, and the defense of Adrianople constituted the heart of the Ottoman empire's efforts to resist the encroachments of Bulgaria in the First Balkan War.

In the 1880s the existing fortifications of Europe, constructed of bricks and mortar and sited close to the cities and localities they were designed to defend, were confronted with almost instantaneous obsolescence. The combination of high explosive, smokeless powder, and delayed-action fuses increased the range and penetrative power of heavy artillery. France, which had just spent 660 million francs on the construction of 166 forts, 43 secondary works, and 250 batteries in a defensive scheme for the eastern frontier, almost dropped out of the race rather than compete.[1] But its

1 Allan Mitchell, *Victors and Vanquished: The German Influence on Army and Church in France After 1870* (Chapel Hill, N. C., 1984), 53–60; Pierre Rocolle, *2000 ans de fortification francaise*, 2 vols. (Paris, 1973), 1:265–94; Jean-Charles Jauffret, "Le bouclier," in André Corvisier, ed., *Histoire militaire de la France*, vol. 3: *De 1871 à 1940* (Paris, 1992).

response was not the norm. From the Low Countries to the Balkans, the armed forces of Europe answered the challenge by pushing forts further away from the areas they were designed to defend, by sinking their batteries lower into the ground, and by strengthening them with steel and reinforced concrete. None of the major powers – not even France, in the last analysis – concluded that the effort and cost of fortification no longer were worth the effort.

The concentration of historians on the so-called spirit of the offensive has caused them to overlook the large allocations for new defensive construction within military budgets in the decade before 1914. Nearly 47 percent of the extraordinary credits voted in Italy between 1907 and 1909 were earmarked for fortification. Italy's most obvious opponent, if theoretical ally, Austria-Hungary, responded in 1911 by drawing up a ten-year program for the construction of fortifications, weighted toward its Italian frontier and equivalent in cost to 37 percent of the total common-army budget for that year. On Austria's eastern frontier, V. A. Sukhomlinov, the Russian minister of war, wanted to demolish or downgrade the fortresses on the Vistula and Narew Rivers, but so forceful was the criticism of his policy that in 1910 he opted to keep twelve forts on Russia's western approaches. The demands of their modernization made deep inroads into the Russian defense budget in the years immediately preceding the outbreak of World War I. The other armies in the main European theaters were vulnerable to the same pressures. Of 987 million marks allocated under the 1913 German army law, 210 million – or over 21 percent – went to fortification. In France the 1914 army law approved materiel expenditures of 754.5 million francs over seven years, of which 231.3 million, or over 30 percent, was for fortification.[2]

Given the experiences of past conflicts, this willingness to spend money on fixed defenses ought not surprise us. However, on another level it is deeply anomalous. Siege warfare enjoyed no support in the mainstream orthodoxies of military doctrine. Ever since Napoleon's pursuit of speed and decisiveness had caused him to bypass fixed defenses, the pundits had condemned the technicalities developed and refined by Sébastien le Prestre de Vauban and others. The elder Moltke expressed the conventional view: Forts, he argued, constrained the mobility of an army and tied down troops who would be better engaged in the field.[3] He specifically rejected the conclusion that the forts of Paris had proved influen-

2 These figures are all derived from David Stevenson, *Armaments and the Coming of War: Europe, 1904–1914* (Oxford, 1996), 10, 134–5, 141, 155–6, 295, 312–13.

3 Daniel J. Hughes, ed., *Moltke on the Art of War: Selected Writings* (Novato, Calif., 1993), 10, 98–107.

tial in the course and outcome of the war of 1870: The French army withdrew behind their defenses precisely because it had already been defeated in the field. And where Moltke went, others followed – even in France. Captain Georges Gilbert, one of the key figures in the revival of French military thought after 1870, wrote: "Passive and useless during the period of major battles, our system of defense on the frontier will be of no value in the event of a reverse."[4]

For critics like Gilbert, if forts justified themselves, they did so only as agents for maneuver. First, they could screen an army at the outset of hostilities, allowing it to mobilize and concentrate without disruption from the enemy; thus they were a means for the achievement of rapid offensives and quick victories. Second, in certain circumstances they might liberate men, not shackle them: fixed defenses could permit ground to be held with fewer troops, thus enabling a commander to create a *masse de manoeuvre* for decisive operations elsewhere. Thus before 1914 the Germans fortified Alsace-Lorraine in the west and upgraded Graudenz and Posen in the east, thereby economizing in troops in both sectors and freeing resources for the main offensive thrust through Belgium.[5]

In general the tensions between the budgetary requirements of fixed defenses and the manpower needs of field armies were not as creative as these two illustrations suggest. Siege warfare spanned a deep chasm between theory and practice in European warfare. An explanation that looks simply to historical precedent – to the view that sieges had dominated and limited warfare in the eighteenth century and that Napoleon had rejected their constraints – is locked too closely into Clausewitzian interpretations of the past. Other rationalizations are required, and they are pregnant with implications for the development of "total" warfare.

The business of fortification and sieges was highly technical. The scientific knowledge of sappers and gunners dominated, and tactical and technological considerations were paramount. As the developments of the 1880s had shown, it was an aspect of warfare – not unlike war at sea – where the latest innovations could have more than marginal significance. By contrast, the vocabulary of mobile warfare was not so preoccupied with tactical and technical detail. Its focus was less on the mechanics of battle itself than on operations, on the way a commander used an entire theater over the course of a campaign. The concepts it embraced – envelopment, breakthrough, counterstroke – were consistent across time.

4 Rocolle, *2000 ans*, 1:291.

5 On German forts in 1914, see Militärgeschichtliches Forschungsamt, ed., *Deutsche Militärgeschichte*, 9 pts. in 6 vols. (Munich, 1983), 5:212–13.

Military thought, shaped by the Enlightenment, sought to establish universal and continuous principles of war: Maneuver war at the operational level met that need.[6] Its indirect consequence was a derogation of technological change. This is not to fall into the trap of seeing generals as intellectual Luddites, resistant to new technology; it is simply to say that the level of war with which they were most concerned did not require them to confront new technology as directly as siege warfare did. The most significant technical innovation that affected maneuver war in the nineteenth century was the railway, but it could be interpreted as an agent of mobility and thus be absorbed into an existing intellectual framework.

The tension between siege warfare and maneuver warfare thus was a tension between technology and ideas, between change and continuity. The "new" elements of war, and the consequences of its industrialization, were to be found in the former rather than the latter.

In another respect sieges also were precursors in the microcosm of total war. Forts tended to be associated with cities, even if by 1914 the most sophisticated systems placed the defenses at some distance from the principal conurbations. Thus the corollary of siege operations was the involvement of the civilian population in the business of fighting. Even in the era of so-called limited war before 1789, the attackers drew little distinction between the military defenders and civilian residents, and both were equally exposed to the plunging fire of siege artillery and the debilitating consequences of starvation and disease. Once the walls were breached, the civilians were more likely to suffer than the soldiers – with their property looted and the women raped. The effects, as Moltke knew from Paris in 1870–1, could be literally revolutionary.

Mobile warfare, however, put the focus on the field army. It ensured that warfare was a matter for professionals only. The apparent truism that armies reflect the societies of which they are a part may in reality be a deception, at least for Europe from 1861 to 1914. Although for the most part conscripted, their ethos was professional and regular; they emphatically rejected the ideas of the nation in arms, of citizen armies and militias. The German army, for example, was not representative of a cross-section of German society as a whole. The growth of general staffs was the most obvious manifestation of this pursuit of professional self-regard. They were made up of long-service regulars who passed the years of peace planning for war. What they did segregated them from the activ-

6 On this point, see especially Azar Gat, *The Origins of Military Thought from the Enlightenment to Clausewitz* (Oxford, 1989).

ities of civilians and turned them inward, narrowing their perspectives and heightening their own estimation of themselves and their potential opponents. The operational level of war on which they focused, practiced on maps and in staff rides, was a metaphorical playing field – a world unencumbered with large cities and devoid of civilians pursuing other vocations.

This was of course wishful thinking. However fast the passage of an advancing army, it could not but have consequences for the local population. Its soldiers needed billets, and its horses required fodder. The fighting of August and September 1914 testified to this. The stories of atrocities perpetrated by soldiers in World War I belong overwhelmingly to these months. The German army, in its pursuit of victory in the west and mindful of the efforts of the *francs-tireurs* in 1870–1, used terror to cow the peoples of Belgium and northern France.[7] Similar reports emerged from the brief Russian occupation of East Prussia and from the Austrian incursions into Serbia. The fluidity of the front line in mobile warfare created uncertainty as to which side the residents of the area were on. The problems of keeping up supply to a moving force drove soldiers, already exhausted by marching and fighting, to looting and pillaging. Even the most massive instance of the use of terror in the war, the Turkish slaughter of the Armenians, is rooted – according to at least some accounts – in the difficulties of conducting mobile operations amidst a people of uncertain loyalty.[8]

A consequence of the stabilization of the fronts therefore was the protection of the civilian population. A defined and fixed front line made it clear whose side most people were on. The depth of operations, particularly on the western and Italian fronts, was limited in geographical terms. The complaint of the soldier on leave – that those at the rear did not seem to know that there was a war on – reflected the security that static war conferred. The civilians' experience of "total" war in 1914–18 was much less dangerous and destabilizing than in many previous wars. In this respect the displacement of maneuver warfare by siege warfare in the winter of 1914–15 had the effect of limiting the war. Not until the mechanization of warfare would streams of refugees clog the roads of Europe.

7 John Horne and Alan Kramer, "German 'Atrocities' and Franco-German Opinion, 1914: The Evidence of German Soldiers' Diaries," *Journal of Modern History* 66 (1994): 1–33.

8 Richard G. Hovannisian, *Armenia on the Road to Independence, 1918* (Berkeley, Calif., 1967), 41–57; Wolfdieter Bihl, *Die Kaukasus-Politik der Mittelmächte*, pt. 1: *Ihre Basis in der Orient-Politik und ihre Aktionen 1914–1917* (Vienna, 1975), 169–71.

The construction of fixed defenses may have prevented the direct effects of war being visited on civilians, but it also promoted a raft of indirect consequences. To reiterate, siege warfare was at the cutting edge of industrialized war. Insofar as armies had sufficient stockpiles of heavy artillery in 1914, it was because they had anticipated the need to destroy or defend fortifications. The near-universal application of the conditions of siege warfare put the weight on technological innovations and the maximization of mass production: The civilian became a unit of resource in the mobilization of war industry. Increasingly, it seemed that he (or she) had traded fundamental liberties – the right to strike or the freedom to shift employment – for the benefits of physical security. In Germany the authority of the army to direct the affairs of civilian society rested – significantly enough – on the Prussian law of siege: Implemented on the first day of mobilization, it had not been revised since 1851 and conferred extraordinary powers on the commanding generals of each corps area. Total war expressed itself at the home front in terms of loss of freedoms rather than in loss of lives.

Thus siege warfare in 1914–18 involved the civilian in the business of war as surely as it had in earlier epochs, but it did so in a radically different way. While armies remained mobile, their pauses to fire were less frequent and so their consumption of munitions was restricted. This is not to say that mobile warfare in 1914 did not generate shortages; it did, but they tended to be local and limited, the consequence of transport problems more than of inadequate production. But when armies dug trenches and erected field fortifications, they became more dependent on artillery, and on mortars and grenades. Infantrymen could not assault such positions without preliminary bombardments and supporting fire. The gunners themselves could identify more targets and could rely on more secure lines of supply: Both were factors that encouraged greater expenditure of munitions.

Of course, the trenches were not adopted out of any conscious wish to forfeit maneuver warfare for siege warfare. They were built to save lives, because they protected infantry on a fireswept battlefield, and to enable ground to be held with fewer troops, thus freeing men for a *masse de manoeuvre* elsewhere. But trenches then became an end in themselves; in the process, operational concerns became secondary to tactics, and concepts were subordinated to technology. The prewar neglect of siege warfare on the part of military theorists left generals bereft of ideas; thinking about the new conditions of war began at the bottom, in the minds of those who had direct experience with what was happening.

Thus tactics dictated operational possibilities, and they in turn threatened to usurp the direction of strategy itself. The result was intellectual confusion.

This is not to say that there was not already a lack of clear thinking before 1914. The distinction between tactics and operations was one honored as much in the breach as in the observance. Schlieffen's plan for a massive envelopment launched through Belgium was an operational maneuver. And yet he used Hannibal's victory over the Romans at Cannae and Friedrich II of Prussia's use of the oblique order at Leuthen as historical precepts: Both were examples derived from the battlefield itself and therefore essentially tactical in nature. His search for France's exposed northern flank was prompted by his appreciation of, and respect for, the defensive barrier on the Franco-German frontier. The difficulties that the latter posed to him were tactical – how to break open a network of fortifications, particularly when operating to a potentially tight timetable – but his solution was operational. Schlieffen escaped confronting the tactical conundrums of the modern battlefield, dominated by the new technology of machine-gun and field howitzer, by falling back on the devices of the operational level of war.

The confusion was not confined to Schlieffen: It is reflected in many modern criticisms of the spirit of the offensive. The fact that the German war plan of 1914 was offensive is not proof in itself of a political commitment to initiate an aggressive war. Both operational and geographical reasons argued that Germany should conduct a war in Europe offensively, even if that war had been embarked on for defensive reasons. Equally, the development of an offensive war plan was not necessarily evidence of a commitment to the tactical offensive. As the elder Moltke pointed out, the strategic offensive could be combined with the tactical defensive, and the strategic defensive with the tactical offensive.

These distinctions were often no clearer then than now. They were certainly obscured by François-Jules-Louis Loyzeau de Grandmaison, whose lectures of 1906 and 1911 are often the butt of criticisms of pre-1914 French tactical thought. But Grandmaison needs to be set in context. Many French officers argued that their operational planning was too passive and too reactive. They believed that, rather than forfeit the initiative to the Germans, France should be prepared to rethink its doctrine on the use of advance guards and the counteroffensive. Obviously, this was not an argument that France should initiate war in Europe. But equally, it also was not a case for attack at the tactical level, a phase whose

difficulties Grandmaison appreciated. His advocacy of the offensive was primarily operational.[9]

The intellectual failure to distinguish the differing levels of war was never fully resolved during the course of World War I. Generals came to accept that the pattern of the war was shaped in the first instance by tactical possibilities: Both Ludendorff's March 1918 offensive and the British army's riposte from August 1918 onward bore testimony to that. They worked because they got the tactics right. But generals also continued to search for the moment when tactical success could be translated into operational breakthrough. When they did not search, as Ludendorff apparently did not, then they stood condemned; when they did so too often, as Haig did, then they also were damned. Operational success remained the goal. Arguably, neither side appreciated the imminence of victory in late 1918 precisely because what had been achieved could not be expressed in such terms. There had been no breakthroughs and no envelopments: Both successes and defeats were essentially tactical. Haig's eagerness to accept the armistice in October on whatever terms resided in his belief that the offensive was running out of steam.[10] He failed to appreciate the extent of his army's success because it was measured in tactical blows, the effects of which were not manifested in Napoleonic maneuver but in the collapsing morale and internal disorder of the German army. By the same token, many in Germany remained surprised and mystified by the extent of their defeat: The stab-in-the-back legend may have been a device to obscure the military collapse, but its adherents included many who were genuinely perplexed by what had happened. The scale of their strategic defeat seemed out of proportion to what they had suffered on the battlefield. Significantly, Ludendorff's own crisis of confidence at the end of September 1918 was generated not by the blows delivered on the western front but by the restoration of operational maneuvers at Salonika and the consequent surrender of Bulgaria.

To understand World War I and its outcome, new theoretical methodologies were required. The framework provided by Napoleon and his interpreters, particularly, of course, Antoine-Henri Jomini, had to be abandoned in favor of doctrines that recognized two of the many ways in which war had changed.

9 For examples of this muddling of the levels of war, see Jack Snyder, *The Ideology of the Offensive: Military Decision Making and the Disasters of 1914* (Ithaca, N.Y., 1984); Douglas Porch, *The March to the Marne: The French Army, 1871–1914* (Cambridge, 1981), 213–31. Cf. Henri Contamine, *La révanche 1871–1914* (Paris, 1957), 167–83; Henri Contamine, *La victoire de la Marne 9 September 1914* (Paris, 1970), 122–36.

10 See Robert Blake, ed., *Private Papers of Douglas Haig* (London, 1952), 333.

First, effective command no longer was the business of the commander in chief. His job was to manage and orchestrate rather than to lead and inspire. The latter were tasks that had to be delegated to his juniors, who were in more immediate contact with the troops and the battlefield. This was one reason why operations became subordinated to tactics. Delegation tended to mean loss of overall direction. If the commander in chief continued to try to control operations, the lack of an effective communications system robbed his decisions of speed and flexibility; perforce, he reacted to events rather than shaped them. Thus fighting developed its own momentum: Loss of control contributed to the sense that this was a total war.

Second, any new doctrine had to recognize the dominant role of resources, both human and industrial. Beyond enjoining their readers to concentrate masses on the decisive point (which was in essence an observation about the conduct of operations, not an injunction in favor of industrial mobilization), neither Jomini nor Clausewitz said much about the economic aspects of war. Their focus was on ideas, and the implications of Clausewitz in particular were that the genius of the great commander and the superior morale of his troops could triumph over larger forces. In 1914–18 the primacy of tactics made the application of superior technology, both in quality and in quantity, a cardinal precept of the war. Means became more important than ends: Again the implication was a headlong rush toward total war.

World War I therefore produced a fresh vocabulary to explain this new sort of war. On the one hand was the word attrition; on the other was a concept possibly even more imprecise and covered by a number of phrases – machine warfare, mechanical war, a battle of material, industrialized war. The point about both is that they began with tactics and tactical possibilities and shaped strategies accordingly. They were ideas about war that put technology at the forefront and subordinated ends to means. Above all, they were all-embracing and pervasive. In other words, they confused tactics, operations, and strategy even more inextricably than had the ambiguities and wishful thinking of Schlieffen and his contemporaries.

Many of the earliest articulations of attrition can be found at the front line, expressed by those who had firsthand experience of the war's nature. By early 1915, what had begun as a tactical observation concerning the trade-off between ground held and lives lost was being developed and elevated into an operational method.[11] Henry Rawlinson, observing the

11 See, e.g., Rudolf Binding, *A Fatalist at War* (London, 1929), 20, 48, entries of Oct. 27, 1914, and Jan. 16, 1915.

qualities of defensive firepower and the determination to recover ground once forfeited, argued that the way to conduct the war was to take a "bite" out of the enemy's front line and "hold" it, forcing the enemy to regain what was lost. Thus, the defenders would become the attackers and, in so doing, would suffer heavier losses. General Henri-Philippe Pétain was making similar points at about the same time. It took the British and French armies until 1918 to be able to fully implement this approach, particularly because they could rarely resist the temptation to bite off more than they could chew.[12] But the concept also suffered from a number of practical and intellectual difficulties that in the process turned it from a method for limiting attacks and minimizing casualties into a method of "total" war.

First, it presumed that the attacker would suffer more casualties than the defender. In reality there is little evidence from World War I to support this: The British, the attackers, suffered more losses than the Germans on the Somme, but the French, the defenders, suffered more losses than the Germans at Verdun. In both examples the differences were sufficiently slight to contribute to continuing controversy. What determined the comparative losses was not attacking or defending but the quality of preparation and, particularly, of artillery support. Furthermore, the reason that the aggregate losses in such battles were so high was their length over time. Unlike the battles of previous wars, the so-called battles of World War I lasted not days but months; indeed they were more like campaigns and hence productive of another source of confusion between tactics and operations. For casualty figures to show significant increases on a daily basis maneuver warfare had to replace trench warfare – operations had to take priority over tactics. For the French the opening engagements of 1914 were far more sanguinary than the battles of 1916; for the British the concluding battles of 1918 were more costly even than Passchendaele.

Attrition at the tactical level therefore had the potential to limit war, not to make it more nearly "total." However, it rested on the presumption that the ground that was seized from the defender was ground that the defender was determined to regain. If that was not the case, then the defender's most sensible option was to accept the loss and thus avoid casualties. The value of the ground could be expressed in terms of tactical advantage – it might, for example, enable observation of the enemy's posi-

12 Robin Prior and Trevor Wilson, *Command on the Western Front: The Military Career of Sir Henry Rawlinson, 1914–1918* (Oxford, 1992); Stephen Ryan, *Pétain the Soldier* (Cranbury, N. J., 1969), 63–77.

tions – or of strategic advantage. The Ypres Salient assumed importance because for the British it guarded the Channel ports and their main lines of supply, and for the Germans it secured the Roulers railway junction. In those circumstances an operational method founded on tactical realities was reworked by strategic imperatives. Armies would fight an attritional battle because of the dangers or benefits of a breakthrough on that particular sector. Thus maneuver warfare intruded on attrition and in doing so protracted and extended the battle over time. The attritional battle could take place because there were objectives that were important in traditional operational terms, and so attrition became a means not of limiting the war but of extending the battles that were the war's components.

The element of paradox in all this was equally evident at the level of grand strategy. If the idealized aim of the attritional battle was to exhaust the enemy through a limited engagement, then intellectually it was of a piece with economic warfare itself. Both the British use of blockade and the German commitment to U-boat warfare aimed at the exhaustion of the enemy's resources. Both were blunt instruments, ensuring that civilians rather than soldiers bore the brunt of the shortages and hitting neutrals as well as belligerents. Thus, when expressed in maritime terms and in terms of national strategy, attrition became an element of total war.

But the prospect that an attritional strategy held out was only of a limited victory. If one side began to run out of the men or the material with which to fight, the process would be gradual rather than sudden. It would have the opportunity to negotiate a compromise peace. The probability seemed to be that the war would not end conclusively, that World War I would be just that. For this reason both sides formulated war aims that anticipated a second bout of hostilities after they had had a chance to recuperate from the first. Thus, at the strategic level, attrition – precisely because of its effects in limiting realizable objectives – generated pressures that made the war more total. One pressure was upward: the inflation of war aims that were increasingly out of step with military possibilities. The other was downward: the need to find a decision at the operational level by moving from the limited objectives of attritional methods to battlefield victory. The latter converged with the other factors that turned attrition from a method of limiting war at the tactical level into a way of expanding it at the operational level.

Attrition was – and is – a fuzzy concept, not least because it can be applied at every level of war, enabling those who use it to confuse one level with another. Machine warfare, by contrast, seems much more clearly

tactical and technical than economic and industrial. The very use of the words *machine* or *mechanical* implies exactness. And when the vaguer word *material* is applied, its employment in conjunction with "battle" rather than "war" helps it gain in definition. In reality machine warfare was as confused an idea as was attrition.

Once again, it operates with the greatest clarity at the tactical level, not least because that is the level from which it derives. One of the central conundrums of World War I fighting was the reintegration of fire and movement, the former being provided by the artillery and the latter being left to the infantry. One solution was the more effective coordination of the two through improved artillery techniques, so that the infantry could operate more closely with the artillery barrage. Another was the equipment of the infantry itself with more portable firepower – machine guns, grenades, and flame-throwers. Tactics therefore were reworked in light of this new technology. Although all these weapons were means of destruction, the aim of the new methods that they spawned was to save lives – at least those of their users if not of the enemy's. Adequate artillery preparation was intended to suppress or destroy the enemy, thus preventing the infantry from suffering heavy casualties when they went over the top. Light automatic weapons meant that fewer men would apply greater firepower: As the war went on, all armies' divisions reduced their manpower while increasing their firepower. Thus, machines substituted for men. At one level, therefore, machine war was a bid to curtail the damage done by modern war.

Of course, it did not work out like that in practice. Casualties in 1918, particularly those suffered by the German army in the first half of the year, suggest that the trade-off between men and machines at the tactical level was a poor one.[13] This may have been because in reality there was no trade-off: Armies wanted to extract as much as possible from the available manpower as well as from the new machinery. Indeed, by 1918 the difficulty for the Germans was not too few machines but too few men to work them. Guns lay idle for lack of gun crews.[14] Thus those men who were fighting were asked to give of themselves to an even greater extent. Ludendorff's development of new tactical methods rested as much on the reassertion of the primacy of morale as it did on the applications of new weaponry. Ernst Jünger's *The Storm of Steel* is an obvious illustra-

13 Wilhelm Deist, "The Military Collapse of the German Empire: The Reality Behind the Stab-in-the-Back Myth," *War in History* 3 (1996): 186–207.

14 Ernst von Wrisberg, *Wehr und Waffen 1914–1918* (Leipzig, 1922), 56–7; ibid., *Heer und Heimat 1914–1918* (Leipzig, 1921), 40, 59.

tion of the point.[15] It shows how the tactics of machine warfare heightened the demands on the individual, permeating his psyche and making the business of combat even more complete in its embrace. The practice of machine warfare at the tactical level in 1918 owed much to the pre-1914 vocabulary of "the spirit of the offensive."[16]

Given the destructive effects of modern weaponry, the preceding discussion may seem a somewhat circuitous and perverse route by which to reach the seemingly obvious conclusion that machine warfare at the tactical level made war more total. The relevant point, however, is that at the tactical level the theory and practice of machine warfare proved divergent. By contrast, the effects of machine warfare on operations and on national strategy created less obvious tensions between theory and practice. This may have been because there was no obvious theory of machine warfare at the operational level. The ideas were tactical, and confusion arose precisely because tactical methods were used to do duty for operational thought. Ludendorff specifically rejected operational objectives, preferring to put the outcome in the hands of tactical success and so forfeiting the opportunity to convert the latter into the former. Arguably, the British and the French had judged their abilities more realistically, setting limited objectives for their attacks in the autumn of 1918, thus ensuring that a sequence of essentially tactical successes could accumulate into something approaching an operational result. At the risk of repetition, the point is that higher control was fragile and without it fighting could generate its own direction, unfettered by clear objectives.

After the war, the advocates of tanks and air power would argue that machine warfare did constitute an operational method and that it was a way of limiting war – but in this there were elements of the wishful thinking of the pre-1914 advocates of operational maneuver. Even in theory machine warfare could only become consonant with more limited objectives when new technology was allied to real-time communications, thereby restoring the possibility of effective higher control.

Any suggestion that in the long run machine warfare would, in resurrecting operational maneuver, restore war to some self-contained professional compartment was vitiated by its impact on national strategy. The demand for more weapons and for weapons of ever greater sophistication had an immediate impact on industrial and economic organization. Hindenburg and Ludendorff are given the credit for the adoption of the

15 Ernst Jünger, *The Storm of Steel* (London, 1930), 255, 273–80, 308–12, 316–17.

16 Hew Strachan, "The Morale of the German Army, 1917–18," in Peter Liddle and Hugh Cecil, eds., *Facing Armageddon: The First World War Experienced* (Barnsley, U. K., 1996).

tactics of machine warfare in the German army; the same duo also were responsible for setting revised targets in the production of munitions and for increasing military intervention in the war economy. In both cases the claims for their originality probably are exaggerated. The essential point is that machine warfare spanned a spectrum from the fighting methods of the storm troopers to the evolution of corporatism: War, unrefined and unstratified, was its common denominator. For Ludendorff the nation existed to serve the needs of the war. Thus, machine warfare became total war in a political and economic sense as well as in a tactical sense.[17]

World War I was not a "people's war." Lawrence and the Arabs apart, its commanders spurned the methods of guerrillas. In none of the conquered territories of Europe did the local population rise up against the invader. When in October 1918 Rathenau proposed a *levée en masse*, he was rebuffed. The conduct of the war remained in the hands of the armies, and static, trench warfare helped that to be the case. World War I therefore was in one significant respect limited.

The effect of immobility was to increase those armies' resource requirements. It also was to lengthen the war. Both had consequences that made war more nearly total. Military doctrine was recast in terms of resources, with the result that means became more important than ends. The civilian populations, having escaped many of war's direct effects, were instead implicated by way of economic mobilization. States, including those that saw themselves as liberal and constitutionalist, defined themselves in terms of their capacity to wage war. The consequences were politically totalitarian as well as militarily total, and in the long run it would then encourage postwar military theorists to seek methods by which civilian populations could be rendered directly vulnerable once again.

Ironically, such thinking would be justified in terms not dissimilar from those used by the pre-1914 exponents of operational warfare. War would become limited because it would be fast and decisive; its ethos would continue to be that of a regular and professional élite. These arguments continued to confuse tactics, operations, and strategy. As World War II was to show, it was possible to restore mobility to war at the tactical and operational levels without achieving any reduction in its length. Furthermore, national strategies would mean that the civilian populations were implicated both indirectly through political and economic mobilization and directly through strategic bombing and guerrilla warfare. Both the air-

17 Michael Geyer, "German Strategy in the Age of Machine Warfare, 1914–1945," in Peter Paret, ed., *Makers of Modern Strategy from Machiavelli to the Nuclear Age* (Oxford, 1986), 538–52.

plane and the tank had the capacity to cut through theoretical stratification in analyzing war: From their production to their employment in action they created a loop between grand strategy and minor tactics that made clear analysis all the harder for seeming to be redundant. But if we are to move beyond crude generalizations and, above all, to understand the relationship between total war as a phenomenon and the military conceptions that often unwittingly underpin it, then theoretical distinctions are of practical significance.