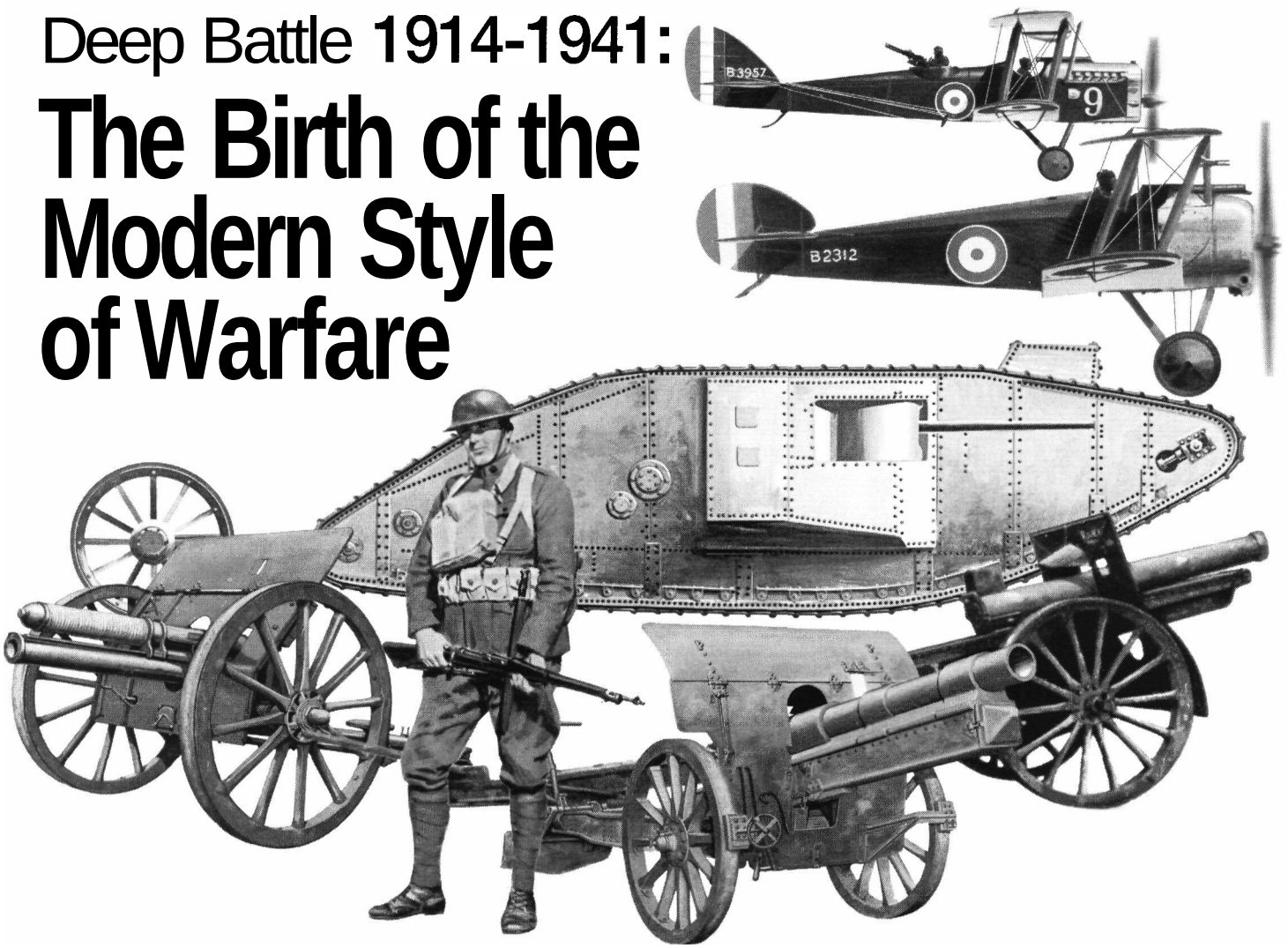
Deep Battle 1914-1941: The Birth of the Modern Style of Warfare



by Brigadier Jonathan B.A. Bailey, MBE

Editor's Note. *This article is the first of two exploring the concept that the First World War was the most significant revolution in military affairs (RMA) in history. In this first article, Brigadier Bailey discusses the significance of the birth of deep battle in the First World War and shows that all developments that have followed only complement this model. In the second article, he will discuss the persistent underestimation of firepower in the 20th century and how armies can learn from the patterns of technological developments that have enhanced the deep battle concept since the First World War. For more comprehensive information and references on the RMA and its impact, read the Strategic and Combat Studies Institute's Occasional Paper Number 22: "The First World War and the Birth of Modern Warfare" written by Brigadier Bailey. The 1996 pamphlet is available in several US military libraries or can be obtained from the Editor, Strategic and Combat Studies Institute, British Staff College, Camberley, Surrey, GU15 4NP, United Kingdom.*

There is a misguided tendency in military cultures to assume that the more recent military history is, the more "relevant" it is. The familiar from our recent past may be reassuring because of technical trappings and the availability of data when, in fact, older and less familiar periods may be more relevant conceptually.

The focus on the recent past also may tend to encourage the flawed view that history can tell us what to do next rather than, as Clausewitz recommended, develop our "educated judgement." The military needs to make up its current deficit in historical study, particularly of the First World War. Conceptually, the First World War gave birth to the deep battle, a model for the Modern Style of Warfare, and by studying that war, military professionals can help develop educated judgement for the future.

The Contention

My contention is that the most significant RMA in the history of warfare took place between 1917 and 1918. It amounted to the birth of modern warfare with the advent of artillery indirect fire as the foundation of planning at the tactical, operational and strategic levels of war—the invention of deep battle.

This phenomenon was so revolutionary that the burgeoning of armor and airpower and the arrival of the Information Age since then have been no more than complements to it—incremental technical improvements to the efficiency of the conceptual model of the Modern

Style of Warfare. They are its products, not its peers.

I contend that this RMA had technological and tactical but, most crucially, conceptual components. While elements of the first two existed before the First World War, it took the shock of war to act as a catalyst for change. From the solution to pressing tactical problems emerged the unforeseen possibility that the new techniques of deep attack might create a new operational paradigm.

Equally, as the means of prosecuting deep battle have became ever more sophisticated, so the logic of the Modern Style of Warfare has encroached upon and now dominates the strategic level.

Modern Style of Warfare. Let me paint a picture of what we understand by the Modern Style of Warfare, using offensive operations as an example:

• It takes place over an extended area and is three-dimensional.

• The importance of time is critical in terms of tempo and simultaneity.

• Information about enemy dispositions is gathered by aerial, electronic and optical means. This is transformed into intelligence about enemy intentions and potential targets throughout the depth of the enemy positions.

• The capability exists to hit high-payoff targets accurately throughout the enemy's space; the targets can be attacked separately or in synchronization with the contact battle.

• A plan is developed for maneuver forces to achieve a rapid penetration or breakthrough.

• The fire plan creates shock and maximum dislocation. It's synchronized with air operations and the scheme of maneuver to achieve a synergy of effects. The weight of fire is carefully measured according to the neutralizing or destructive effects required. The fire plan attacks enemy headquarters, communications systems, artillery, logistical operations, bridges and depots. It blinds enemy observers and destroys strongpoints and field defenses. It attacks enemy positions in depth—especially the enemy reserve before it can join the contact battle—sealing off the battlefield and harrying any who flee.

• Command, control and communications (C^3) systems and styles of command that can fuse the capabilities of these systems can break the enemy's cohesion and will with catastrophic consequences.

• The plan includes ruses and deceptions, including a complete dummy fire plan, if necessary.

Mules Hauling Ammunition at St. Baussant, 1918

• Planning for this operation is conducted at a high level under centralized command, but measures are taken to make the plan responsive to the unexpected that will inevitably occur.

This generic model is readily recognizable in the doctrine of NATO and Warsaw Pact armies of the Cold War, in the operations for the Egyptian crossing of the Suez Canal in 1973 and, more recently, in the minds of Gulf War planners. At the tactical level, many of the components are integral to a contemporary attack helicopter cross-FLOT (forward-line-of-own-troops) operation. It is also the precise blueprint for battle as tested by the British Army at Cambrai in November 1917, but seen in more complete form in the German offensives of spring 1918, the "*Kaiserschlacht*," and the Allied offensives later that year.

Warfare in 1914. More than 80 years later, we know this model of 1917 as our own style of warfare; but in 1914, just three years earlier, it would have seemed entirely unfamiliar.

• Warfare in 1914 was linear with prevailing doctrines emphasizing flanks, envelopments and annihilations. It was based on the contact battle of physical encounter where maneuver forces were supported by artillery firing directly, generally at short range.

• While the few aircraft could conduct reconnaissance, they had no means of locating targets in depth; relatively few howitzers in service were capable of engaging targets in "dead" ground—ground that can't be observed because of terrain features. Techniques to adjust fires were primitive and generally involved an estimate on the gun position itself. Communication with observers was by a limited number of telephones, semaphore or megaphone.

• In the case of the British field army, all artillery ammunition was shrapnel. There was no means of supplying large quantities of artillery ammunition to maneuver forces in the field, and partly in recognition of this fact, there was very little ammunition.

• Artillery planning did not exist at the operational level, except in siege warfare. Indeed, given the purely tactical operations envisaged, centralized, high-level command of artillery would have been irrelevant.

Clearly between 1914 and 1917 something extraordinary of enduring military significance happened: the indirect fire revolution and birth of modern warfare.

Tactical and Technical Deficiencies of 1914

The revolution was technical, tactical and conceptual, but many of the components that contributed to the indirect fire revolution were not new. The importance of being able to engage unseen targets had been clear even in antiquity. Indirect fire was common in siege warfare, but observers generally were not in a position to adjust the fall of shot and precision was relatively unimportant.

The earliest use of indirect fire on the battlefield was probably at Paltsig in July 1759 by the Russian Army firing over the tops of trees. By 1840 the British had given the howitzer the task of firing from cover at enemy artillery, but this was literally a hit-or-miss business with no calculation. Primitive indirect systems relied upon a line of markers from the gun to the point at which the target could be observed. This made them relatively immobile and, therefore, generally unusable, given the tactics of the day.

The Germans advocated the use of indirect fire as a means of protecting gunners from machineguns based on their experience in the Franco-Prussian War. In 1882, the Russian Karl Guk wrote a seminal book *Indirect Fire for Field Artillery* that described the essentials of aiming points, crest clearance and observer corrections to fire.

The Germans followed these developments and produced a device to facilitate indirect fire called the *Richtflaeche*. By 1904, the Russian artillery had an indirect fire sight used on a large scale at Liao-Yang in August; thereafter in that war, indirect fire became the norm. The US Army noted the value of indirect fire in the Russo-Japanese War as reflected in its artillery "Drill Regulation" of 1907.

The British experimented with indirect fire during the Boer War and concluded that in mobile warfare it was not practical. It was a neglected art, and the Royal Field Artillery did not have an effective indirect fire sight until 1913.

Indirect fire also had been practiced in siege warfare and by garrison and coastal artilleries where the problems of accurate survey were less severe. It was in these branches of the artillery, far removed from the battlefield, that the most progress was made.

Despite the existence of so many componentsthatwouldultimatelybemelded to create the indirect fire revolution, armies failed, or chose not to realize their potential for a number of reasons.

• *No Apparent Tactical Necessity.* All armies of the day planned to conduct fast-moving operations in which it was quite possible that artillery would be unable to keep up.

• *No Apparent Operational Necessity.* There was no concept of artillery being used at the operational level to break through enemy lines; such an eventuality was not contemplated. The exception to this would be the reduction of fortifications, such as those at Liege.

• *No Action to Supply the Means: Guns and Ammunition.* Because fire was generally to be direct, guns had a relatively short range and would not have been able to make the most of an indirect fire concept. Longer range guns would have been heavier, even less mobile and, thus, even less relevant to the prevailing concept. Shortly before the First World War, British designers of a new gun carriage chose to sacrifice range for mobility. Because the primary role of artillery was not counterbattery fire (CB) and because most CB would be direct fire, howitzers were relatively few in number.

Ammunition was of limited utility and did not exist in sufficient quantity to prosecute the sort of concept so familiar three years later. Pre-war doctrine had not envisaged that such a catastrophe could occur. The British war establishment of 1913 allotted each 18-pounder howitzer 1,000 rounds with 300 in the United Kingdom (UK) and an additional 500 to be provided from factories within six months. Of the 1,000 rounds, only 176 were held at the battery level, and they could sustain firing for just 44 minutes at Rate 4. Six such periods would consume the ammunition of the force, with 75 minutes worth in the UK and another 60 minutes worth arriving within six months. In comparison, by 1918 most light guns of both sides expected to fire about 600 rounds per day at the start of an offensive.

While many of the means to fire indirectly existed in some form, there remained substantial technical deficiencies in accuracy. The means of locating targets in depth were wanting, as were the means of predicting fire.

The issue was, however, not merely technical. The prime reason for the failure to exploit indirect fire—given that so many of its means could have been made available—was lack of imagination and doctrinal laziness. Once the brutal necessity presented itself, the technical and tactical problems soon were overcome. The problem also went beyond laziness; in part, it was sheer miscalculation by the conservative military cultures of the day.

As early as 1890, Moltke had expressed concern at the diminishing prospects of avoiding a long war. In 1900, the Polish financier Jan Bloch had foreseen that the overwhelming lethality of defensive firepower would slaughter attacking infantry, and Lord Kitchener predicted the war would last for years. But their views were dismissed because of the unacceptable conclusions that flowed from them.

Artillery was held in the highest social and professional esteem in the Russian Army, which had pioneered indirect fire; but even in the Russian Army, some were deeply suspicious of officers with technical ability. During the Russo-Japanese War, one Russian general, on seeing a battery take up position behind cover, ordered it out into the open; he refused to believe it could engage an enemy it couldn't see.

Meuse-Argonne Offensive, 1918. A Coastal Artillery 14-inch railway gun fires on German targets 20 miles away.

In the British Army, artillery officers' use of maps to fix targets was considered to be ungentlemanly, devaluing the skills of estimating range by eye. The introduction of high explosive (HE) ammunition had been suggested but was dismissed partly on the grounds that it was rumored to give off noxious fumes that would not have been a proper way to wage war. The more probably reasons for not introducing HE was to avoid complicating logistics and the unlikelihood of its ever being required. The elan of horse artillery summed up the ethos of the gunner: survey, mathematical calculations and static operations were the unspeakable diet of the garrison and coastal artillery.

In May 1914, Captain Hill of the Royal Garrison Artillery addressed the Royal Artillery Institute on the subject of indirect fire. He was greeted with hoots of laughter when he asserted that within two months of the outbreak of war, Field Artillery would be making corrections for meteorological variations.

The French and Germans were no better. Artillery was not widely esteemed in the German Army. It is worth noting that the designer of the German blueprint for the Modern Style of Warfare, Colonel Georg Bruchmueller, was only on temporary active duty and, despite the award of the *Pour le Merite*, was never promoted above colonel. He retired on a lieutenant colonel's pay.

In spite of the 1907 US artillery manual's emphasis on indirect fire, Lieutenant Colonel E. McGlachin noted as late as 1916 that some of the most experienced graduates of the US Army's School of Fire could not conduct indirect fire missions. Although the US Army had the equipment and theory to apply indirect fire, it lacked the qualified personnel and, presumably, the will to do so.

Problem Assessed: 1915

The battles of summer 1914 were typified by artillery deploying in the open, rapidly expending its ammunition and being destroyed. The power of machine-guns and rapid rifle fire in the defense brought maneuver to a grinding halt, and there was insufficient artillery firepower to break the stalemate in the offense.

It soon became clear that an entirely new approach would be required, and the problem had to be examined from the first principles. The solution, albeit an imperfect one, took four years to evolve, and is still with us today.

Tactical Problem. The tactical problem was clear. The force had to breach obstacles, destroy or neutralize as many troops manning them as possible, conduct CB fire to protect assaulting troops and be able to fire at unseen targets in the enemy's depth to protect troops exploiting success before the enemy's accompanying artillery could come forward. In 1914 and 1915, artillery could do none of these adequately and, in most cases, not at all.

In the battles of 1915 at Neuve Chappelle, Festubert and Loos, British planners came to understand the new fundamentals of firepower and battlefield geometry by trial and error. At Neuve Chappelle, 10 to 12 March 1915, the British Army deployed 354 pieces against 60 German pieces on a sector of 1,200 meters. This was a density not matched until 1917, yet the British only could fire 200 to 400 rounds per gun. In addition, targeting was defective, although aerial photography was available at the time. At Festubert on 15 May 1915, the attack was preceded by a fire plan lasting 48 hours rather than the 35 minutes of Neuve Chappelle. However, the destructive effect was still inadequate, and surprise was lost.

At Loos on 15 September 1915, the attack sector was eight times longer and the density of guns only one-fifth that at Neuve Chappelle. To achieve the weight of fire required, the guns had to fire for a longer period, again compromising surprise.

The issues were:

- Was it necessary to destroy the enemy obstacles and trenches or rather to neutralize the men defending them?
- How much fire was required for how long to achieve the desired result?
- Could the amount of fire required be calculated through some universal mathematical formula? If so,
- Was this to be expressed in terms of guns-per-yard-of-front or the rounds they could deliver on a given front over a given period, and of what calibers the guns should be?
- Was the rate of fire of the appropriate calibers of ammunition or the availability of ammunition per day the key?
- If an adequate, high rate of fire could be achieved over a critical period, did it matter that this could not be sustained?
- How long should fire be applied before the maneuver phase began?
- How long did a battle last—one week or nine months?

The Operational Problem. Tactical successes were mere attritional encounters if they lacked an operational dimension. The operational conundrum for both sides was how to achieve the breach and breakout.

The Germans defied Allied tactical successes, such as they were, by constructing and withdrawing to ever more formidable fortifications, culminating in the Hindenburg Line. These withdrawals were ever deeper and to denser fortifications and their defense ever more "elastic."

In the defense, the key was to hold a line so far in depth that if the enemy reached it, he couldn't bring his artillery forward fast enough to support his gains, subjecting him to massive defensive fire and counterattack. A "rule of thumb" developed that reserves should be held nine kilometers to the rear, capable of counterattacking within two hours of the start of an attack. The shape of the battlefield, thus, came to be determined by the range of artillery. The ability of artillery to locate and engage targets in depth and to move guns forward rapidly came to have operational significance.

The Conceptual Solution: 1916-18

It became clear that indirect fire would be the key to answering these tactical and operational problems. The starting point was the availability of artillery ammunition and gun barrels. From this a solution might be crafted.

1918 "BC Scope." A Redleg observes the next target from the ruins of war.

Aerial photography permitted precise targeting throughout the theatre and up-to-date mapping of ever-changing trenches. Here an observer operates the Graflex camera from an observaton plane.

Vast attritional experiments were conducted at Verdun and on the Somme. By 1917, it was accepted that, given the concentration of resources, the guns could advance two to three kilometers virtually anywhere. But this tactical achievement could only be bought at the expense of forfeiting any hope of operational surprise and success. Other approaches to the application of firepower would be needed to achieve operational success. By 1918, these approaches were established.

Technical Means. In an astonishingly short time hitherto, conservative military establishments identified the technical obstacles and devised a series of techniques to overcome them. These have stood the test of time and are, essentially, the basis of gunnery today: the conceptual model of three-dimensional firepower. Such a model applies equally to airpower.

Air observers and aerial photography permitted precise targeting throughout the theatre and up-to-date mapping of ever-changing trenches. But not until 1917 were the problems of image distortion overcome to achieve adequate accuracy.

Advances in military survey enabled a gun to fix its own position exactly, an achievement made easier by the static nature of the war. But even when the exact locations of the target and the gun are known, inaccuracies still occurred. The means were devised to minimize these. Meteorological data were gathered and calculations made to compensate. Allowance was made for the wear on each gun barrel, called calibration. The displacement of each gun from the point of survey was taken into account—also the effects of temperature on the propelling charge and variations in ammunition manufacture by batch. By 1918, an 18-pounder could be assumed to fire with an accuracy of 80 mils over a range of four kilometers, a similar standard expected of today's field gun at that range.

Communications to send corrections to the fall of shot remained a problem as they were based on vulnerable telephone lines or primitive radios. At the same time, techniques of electronic warfare were developed to intercept wireless and telephone communications. Pigeons, semaphore and runners also were used. Aerial observers developed elaborate signaling systems to communicate directly with gun positions.

A series of heavier guns and howitzers were produced along with a variety of HE and gas shells and fuzes, the most important of which were the instant and delay fuzes. The instant fuze gave HE effects similar to those of shrapnel without requiring the same skill in firing it. In its way, it was as significant as the introduction of radar fuzes in 1944.

Organizational Means. A new artillery command, intelligence and planning organization was created for the operational and tactical levels. By 1916 in the British Army, the artillery commander at the corps level commanded all the divisional artilleries. He set the times of fire plans, and he allocated observers to batteries throughout the formation. By 1918, artillery planning in the British Army was conducted at the army level and decentralized to the divisions for execution once the offensive was launched.

The Germans did not have a corps artillery until February 1916, and even then it was merely a reserve pool of ordnance. There was no coordination between divisional and corps artillery; the former could not call for the support of the latter. By spring 1918, all German artillery was task organized into seven functional groups divided into sub-groups—a revolutionary departure from traditional command hierarchies.

The distinction between the close and deep battles was fully recognized as was the need to coordinate the two. By 1918, German artillery received times, tasks and areas of fire from the army-level command, but targets were selected by the group and sub-group. As important, the emphasis in training and planning was on all-arms coordination and making fire plans flexible enough to match the new infantry tactics.

An enormous new logistical organization was created to service the unprecedented demands of artillery. The armies of 1914 were the armies of the Industrial Revolution but mere shadows of what the Great Artillery War was to bring forth. The Royal Artillery became larger than the Royal Navy. In the case of the British and German armies, the ratio of gunners to infantrymen doubled between 1914 and 1918 and the French ratio trebled. Whereas in April 1917, the US Army had nine field regiments, by the Armistice it had 234. Gigantic new arms and munitions industries were created with huge social consequences—not the least of which was the emancipation of women.

Experiment and Practice. These technical, tactical and conceptual advances came to fruition in November 1917 in the British Offensive at Cambrai. The firing of the first predicted (as opposed to registered) fire plan was arguably more significant than the first mass deployment of tanks. It was to be the model for the successful offensives of the summer of 1918 on the Marne and at Amiens.

The Germans demonstrated the application of fire in novel tactical and operational ways without armor in their *Kaiserschlacht* of spring 1918 as masterminded by Bruchmueller. Interestingly, in the battles of the last few months of the war, tanks featured less prominently and artillery became even more

dominant. By 1918, artillery had restored maneuver and exploitation to the battlefield, capabilities that had been snuffed out in 1914.

The First World War as an RMA

So how do the events of 1917 to 1918 rate as an RMA? The revolution in the First World War changed the face of 20th century warfare in many ways. Above all, warfare became dominated by artillery—became an ascendancy of fire and artillery by indirect fire.

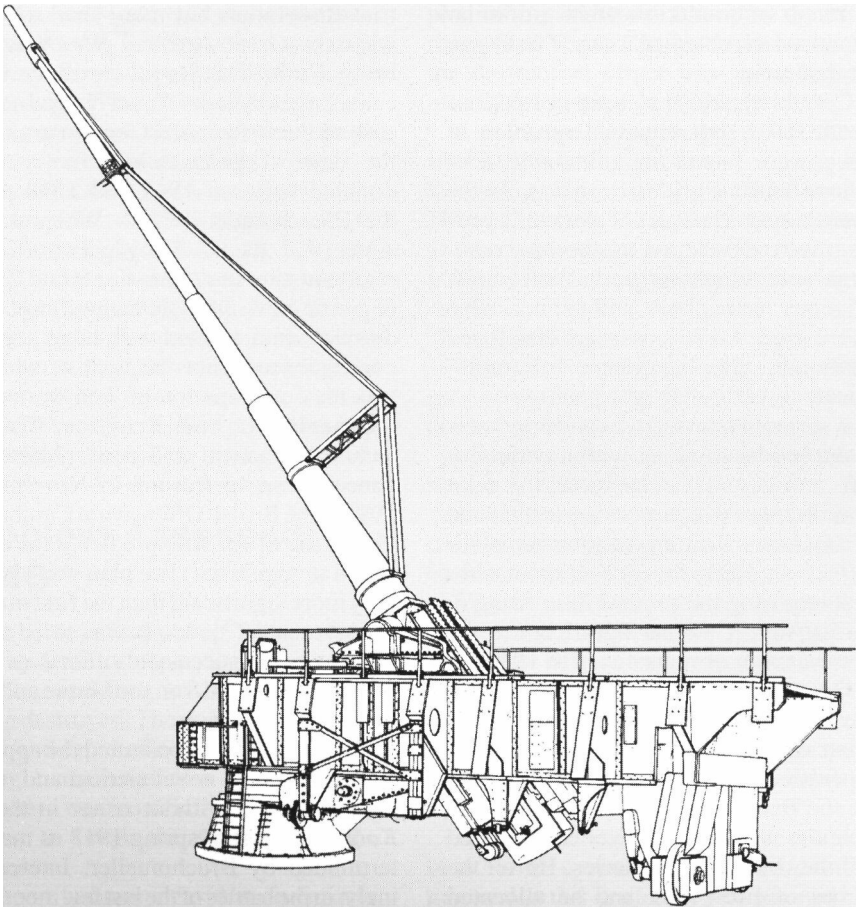
The Schlieffen Plan and the German offensive of 1914 from which it was derived had been the epitome of a style of warfare: two-dimensional linearity—a style perhaps as old as warfare itself.

The revolution of 1917 to 1918 occurred because prevailing ideas firmly rooted in the establishments of the day were out of step and unyielding to the multiple pressures of change. The tectonic plates of firepower and maneuver shifted and could not be restrained by social and technical conservatism, the perceived lessons of previous wars or convenient general staff theory.

The secondary shock from this military earthquake occurred in the following autumn and winter when the imbalance was further magnified by the reinforcement of defense and immobility by the power of the newly developed trench lines. The result was a suppurating stalemate and the gestation of a new concept that would generate sufficient firepower in the offense to make maneuver possible once more.

By 1918, the new paradigm employed three dimensions. Its object was a breakthrough with simultaneous fire into the enemy's rear areas leading to paralysis and collapse rather than mere envelopment. Indirect firepower was the key.

Based on this indirect fire model, the execution of the concepts of 1917 and 1918 was wanting in two primary respects. First, there was a lack of transport to move forward and supply guns over rough terrain in the offensive and, second, both armies lacked the communications to maintain decentralized control over a fire plan once an offensive had begun.



The Paris Gun fired a 264-pound shell more than 60 miles to bombard Paris.

Communications to send corrections to the fall of shot remained a problem as they were based on vulnerable telephone lines or primitive radios.

After the war, the model's implementation was improved by mechanized transport, close air support (CAS) and wireless communications. The absence of these had not prevented the birth of modern warfare; they were the natural consequences of the desire to improve its efficiency. They were technical "fixes" and not, in themselves, conceptually revolutionary.

Modern Style of Warfare after 1918. After 1918, the Germans sought to achieve a paralyzing operational breakthrough using armor supported, not by artillery, but by airpower. Some have described the difference between the Schlieffen Plan and the airpower approach of Manstein's Sichelschnitt as revolutionary, given the concept of the breakthrough in the latter. I would argue that the last four years of the First World War had been precisely about creating a breakthrough, and that Sichelschnitt was merely a replay of the *Kaiserschlacht* with updated technology and tactics.

Therefore, the most instructive comparison isn't between the Schlieffen Plan and Sichelschnitt, but between the Schlieffen Plan and the *Kaiserschlacht* and between the *Kaiserschlacht* and Sichelshnitt. The difference between the first two was conceptually revolutionary and between the latter merely technical and tactical.

From their miraculous victory in France in 1940, the Germans proceeded to learn disastrous lessons, believing that the tactics and technology demonstrated in France constituted an RMA. They missed the point that the critical element in the Modern Style of Warfare is three-dimensional firepower throughout the area of operations. This was a difficult lesson to relearn a few years

later in the USSR when the Luftwaffe could not deliver this and artillery was often not available to compensate. Operations became rooted in the style of flanks, envelopments and attempted annihilations. The rapid strategic breakthrough and paralysis achieved in France was not repeated.

As a result, the Germans were mired in another *materialschlacht* (a battle of relative logistic strength) with the Eastern Front degenerating into a prolonged four-year agony analogous to the final months of 1918. This was a historical model their planning had specifically intended to avoid. Thus the *Kaiserschlacht* and Operation Barbarossa in July 1941 followed a similar pattern.

Strategic Perspective. In 1918, the Germans fired on Paris with their "Paris Gun," an attack in keeping with the emerging Modern Style of Warfare. This attack was the first long-range strategic attack using surface-to-surface systems—a revolutionary conceptual and technical event. Its immediate effect was minimal, but it proved the immature first step along a path that would lead to the V1 and V2 rockets in World War II and the Scud intercontinental ballistic missiles (ICBMs) and cruise missiles of today. The logic of the Modern Style of Warfare is that as technology allows, it has expanded ever outward from its tactical origins to its current dominance at all levels of warfare.

In the 20th century, developments in firepower have outstripped those in maneuver. From 1914 onward, the challenge was to convert a tactical breakthrough into an operational breakthrough, and firepower was the means. Increasingly, the challenge is to make tactical and operational breakthroughs simultaneously strategic—firepower, again, will be the key. This strategic breakthrough may entail operations that are not merely deep in the traditional geographical sense, but also integrated and non-linear wherever and whenever needed to create that effect. This is the enduring dynamic of the Modern Style of Warfare.

Today, some say we're experiencing an RMA. But the fundamentals look similar to those of the First World War and hardly revolutionary by comparison. The new factors generally cited are precise, standoff strikes; improved command, control, communications and intelligence; information warfare; and nonlethality. In First World War parlance, these would be termed accurate indirect fire; improvements in command and control, intelligence and the means of acting upon it; and the munitions and techniques of neutralization and suppression.

US Army Tactical Missile System (ATACMS). By 2005, ATACMS Block IIA will be able to prosecute the deep attack out to 300 kilometers.

The Information Age does not herald a new RMA, rather it adds technical impetus to the conceptual dynamic of the Modern Style of Warfare. The effects of the microchip are no more profound than was the technical apparatus of the *Blitzkrieg* in 1940—both should be seen as scientific attempts to make an older conceptual model operate more effectively. Thus, the joint surveillance and target attack radar system (JSTARS) and similar systems are merely technical developments along the conceptual path pioneered by aerial photography. Likewise, the global positioning system (GPS) is a technical evolution arising from the conceptual revolution that first required firing platforms to survey their positions and make their fire more precise when standing off from targets. Such additions make the prosecution of deep battle more efficient.

Many will naturally be impressed by the enormous technical achievements of their day and insist that the scale of this achievement must warrant the term "revolution," even if conceptually it is not. Without a conceptual perspective, such an analysis latches onto the conspicuous and the material and is impoverished and, probably, unsustainable. At the same time, we are clearly witnessing a period of astonishing change and imaginative innovation in warfare.

The RMA of 1917 and 1918 does not diminish the significance of developments since; but the two are not comparable. For such a comparison, we must await the arrival of four-dimensional warfare—cyberwar or whatever else that may be.

Future wars involving developed nations are unlikely to look anything like the World Wars—we all hope they do not. But the developments in fires between 1914 and 1941 do inform us and confirm how we might best shape our efforts in changed circumstances. The more we study the future, the more remarkable the RMA of 1917 and 1918 is.

Brigadier Jonathan B. A. Bailey, Member of the British Empire (MBE), is the Chief of Fire Coordination for the Allied Command Europe Rapid Reaction Corps in Germany. He commanded the 40th Field Regiment in Germany and a battery in the 4th Field Regiment, Royal Artillery. He also served as a Tactics Instructor and member of the Directing Staff at the Staff College in England, from which he was a graduate, and as the Artillery Operations Officer for the 4th Armoured Division in Germany. Other highlights of his service in the British Army include commanding a Zipra guerrilla Assembly Place in Rhodesia as part of the Commonwealth Cease-Fire Monitoring and serving as an Operations Officer and Battery Commander during the Falklands land campaign. Brigadier Bailey is a graduate of the Higher Command and Staff Course in England and holds a Bachelor of Arts in Medieval History and Philosophy from the University of Sussex. He has written a number of articles and books on the subject of artillery and military history.

Field Artillery Bulletin **Staff:**

Patrecia Slayden Hollis
Editor

Bob T. Coleman
Art Director

Joanne Alexander Brown
Assistant Editor

PURPOSE: As stated in the first ***Field Artillery Journal*** published in 1911—*To publish a journal for disseminating professional knowledge and furnishing information as to the artillery's progress, development and best use in campaign; to cultivate, with the other arms, a common understanding of the power and limitations of each; to foster a feeling of interdependence among the different arms and of hearty cooperation by all; and to promote understanding between the regular and militia forces by forging a closer bond; all of which objects are worthy and contribute to the good of our country.*

SUBSCRIPTIONS/ASSOCIATION MEMBERSHIP: Subscriptions to the ***FA Journal*** come with membership in the Association. Individual or corporate memberships may be obtained through the US Field Artillery Association, P.O. Box 33027, Fort Sill, Oklahoma 73503-0027. Telephone numbers are (580) 355-4677 or FAX (580) 355-8745 or Email: usfaa@sirinet.net. Dues are $20.00 per year for an individual membership ($38.00 for two years and $56.00 for three) to US and APO addresses. All others add $13.00 per subscription year for postage. Corporate Memberships are available at $700.00 per year and Corporate Associate Memberships are $350.00 per year,

SUBMISSIONS: Mail FA or fire support-related articles to ***Field Artillery,*** P.O. Box 33311, Fort Sill, Oklahoma 73503-0311 [DSN 639-5121/6806 or commercial (580) 442-5121/6806 or FAX DSN 639-7773/commercial (580) 442-7773 or Email famag@usafas.army.mil]. Articles are subject to edit by the ***Field Artillery*** staff; footnotes may be deleted due to space. Mail Association chapter news, reunion news and other such information to the ***FA Journal***, US Field Artillery Association, P.O. Box 33027, Fort Sill, Oklahoma 73503-0027 [(580) 355-4677 or FAX (580) 355-8745 or Email: usfaa@sirinet.net].

REPRINTS: The US Field Artillery Association is pleased to grant permission to reprint articles. Please credit the author and the ***FA Journal.***

ADDRESS CHANGES: Members call or write the Association at the telephone numbers/Email listed in "Subscriptions" or the address listed below. Third-class postage paid by the US Field Artillery Association, P.O. Box 33027, Fort Sill, Oklahoma 73503-0027. POSTMASTER SEND ADDRESS CHANGES to the Association at the same address.

Redleg Hotline
(Organization, Materiel, Doctrine and Training)
DSN 639-4020 or (580) 442-4020 (24-Hour)

Tactical Software Hotline
DSN 639-5607 or (580) 442-5607 (24-Hour)

Fort Sill Home Page
http://sill-www.army.mil/index.htm

FA Branch at PERSCOM
http://www-perscom.army.mil/opmd/fasitrep.htm
http://www-perscom.army.mil/enlisted/fa_ltr.htm

FA Journal

A Professional Journal for Redlegs

July-August 1998 Volume III. No. 4

INTERVIEW

4 **History—The** Context for Change in the Army
An interview with Brigadier General John W. Mountcastle, Chief of Military History

ARTICLES: History

7 Staying on the Cutting Edge: Military Professionalism and the Mexican War
by Major R. Powl Smith, Jr.

13 1999 History Writing Contest Rules and 1999 *Field Artillery* Themes

14 From the Parade Ground to the Battlefield: Henry Knox and the Battle of Monmouth
by Captain Michael D. Carter, USAR

19 Steel **Curtain—The** Guns on the la Drang
by Captain Steven M. Leonard, OD

23 Deep Battle **1914-1941:** The Birth of the Modern Style of Warfare
by Brigadier Jonathan B.A. Bailey, MBE

40 Thunder in the Ozarks: The Battles of Wilson's Creek and Pea Ridge
by Majors William S. Bland and William M. Raymond, Jr.

46 Big Gun Vignettes: Fun and Games in WW II
by Colonel (Retired) Robert B. Partridge

ARTICLES: Other

30 Fire Support in Bosnia-Herzegovina: An Overview
by Colonel Mark T. Kimmitt

33 Integrating Targeting and Information Operations in Bosnia
by Lieutenant Colonel Steven Curtis, IN; Captain Robert A. B. Curris; and Major (Retired) Marc J. Romanych, ADA

FEATURES

3 FROM THE FIREBASE

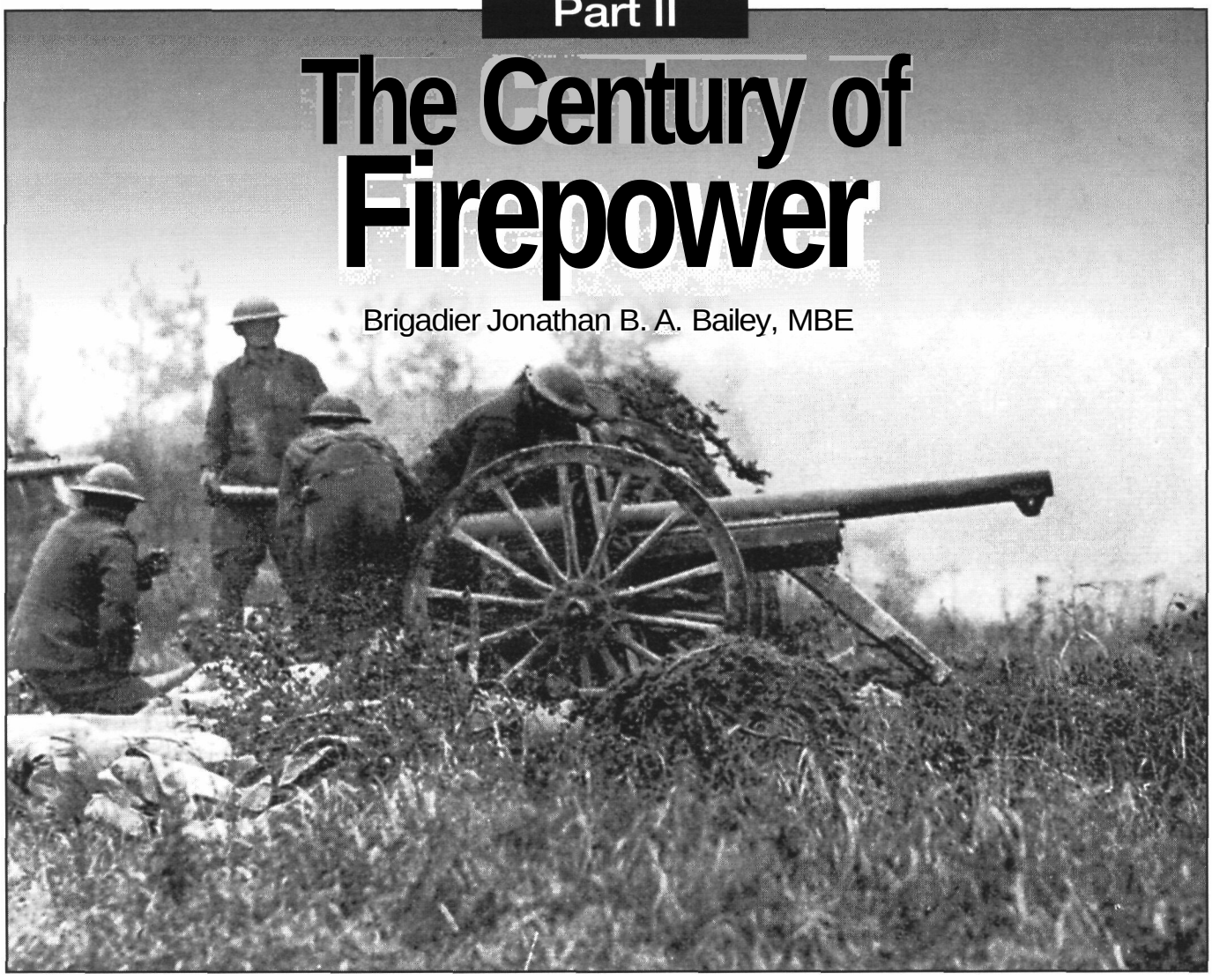
39 VIEW FROM THE BLOCKHOUSE

48 ASSOCIATION NEWS

Part II

The Century of Firepower

Brigadier Jonathan B. A. Bailey, MBE



French 75 of the American 6th Field Artillery, 1st Division in Ardennes, France, 1918

Editor's Note. *This is the second of two articles exploring the concept that the First World War was the most significant revolution in military affairs (RMA) in history and that indirect firepower has persistently been underestimated. Brigadier Bailey's first article was "Deep Battle: The Birth of the Modern Style of Warfare" and was published in July-August 1998. For more comprehensive information and references, read the Strategic and Combat Studies Institute's Occasional Paper Number 22: "The First World War and the Birth of Modern Warfare" written by Brigadier Bailey. The 1996 pamphlet is available in several US military libraries or can be obtained from the Editor, Strategic and Combat Studies Institute, British Staff College, Camberley, Surrey, GU15 4NP, United Kingdom*

In the 20th century, we persistently undervalue the role of firepower in warfare and overestimate the importance of attritional ground maneuver. This article reassess aspects of the First World War, looks briefly at trends in technology and establishes the line of logic from the intellectual landmark of 1917 and 1918 through 80 years of the ascendancy of fires. The ascendancy of fires has implications for the joint and combined battle in the century of firepower.

The Underestimation of Firepower. The following four examples selected from many illustrate cases in which the underestimation of firepower has been fatal in this century.

1. *Predictions of Jean de Bloch.* At the turn of the century, Jean de Bloch predicted the new technology of industrialized warfare would so strengthen the defense that attacking infantry would be slaughtered in horrifying numbers. Wars would become struggles of attrition in which defeat would bring economic, social and political collapse. His views were generally regarded as perverse, and no army reassessed its doctrine in the light of the revolution in firepower he described; they preferred to retain doctrine emphasizing infantry maneuver and willpower over firepower. The prescience of Bloch's analysis was revealed in the Russo-Japanese War of 1904 and 1905.

2. Failure to Adopt Indirect Fire as a System. The effects of firepower in the Russo-Japanese War, especially indirect fire, were well-documented and changes were recommended; but the implications of restructuring armies to deliver that fire threatened the prevailing culture of elan and maneuver—"The Cult of the Offensive."

Doctrine regressed and European armies took the field in 1914 with masses of infantry maneuvering into range of each other's infantry firepower, and as their positions locked, they found they lacked the artillery firepower to gain a decisive outcome. Artillery, which had deployed in sight of its target, was usually blown away. Only by rebuilding the capability to deliver decisive fires after four dreadful years of experiment was the deadlock on the Western Front broken.

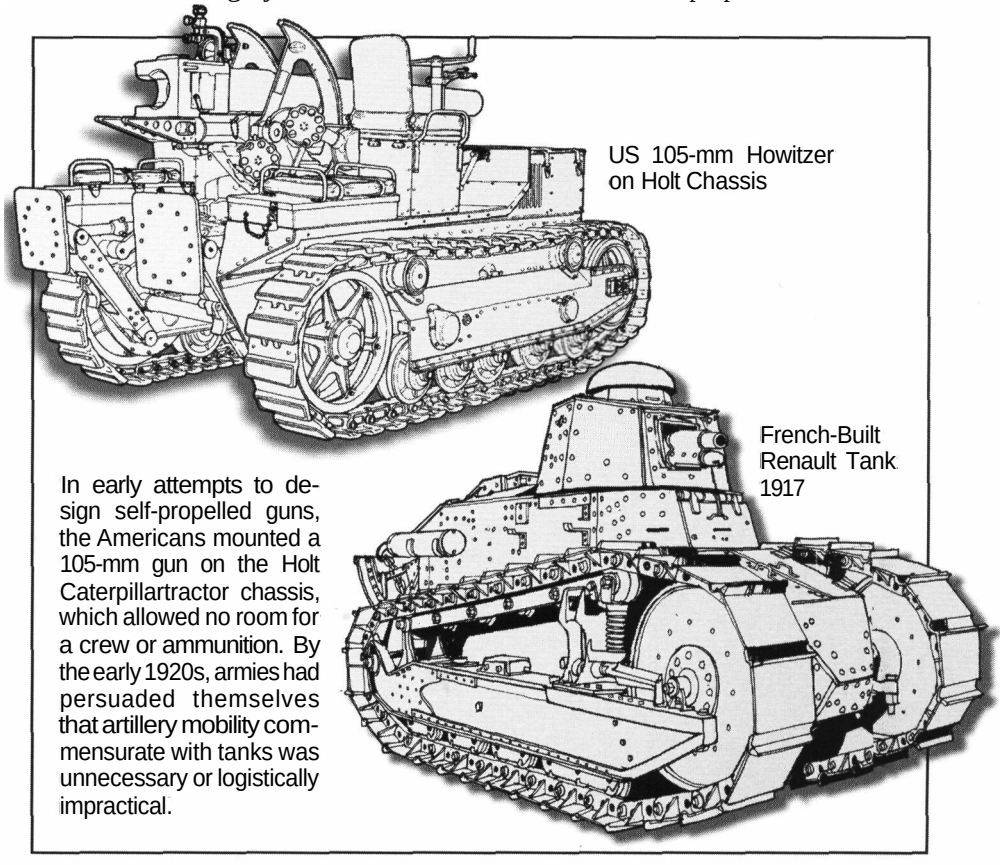
3. Abandonment of the Self-Propelled Gun. Surprisingly, after the domination of artillery in the First World War, a similar underestimation of firepower occurred again, this time in the Union of Soviet Socialist Republic. Almost immediately, a new Cult of the Offensive emerged that promised quick victories and was based on the tank. Typical of the craving to dispense with the burden of artillery was the doctrinal regression that rejected the self-propelled gun.

Self-propelled guns were first produced in 1917, but by the early 1920s, armies had persuaded themselves that artillery mobility commensurate with tanks was unnecessary or logistically impractical. They argued that tanks did not need artillery support, and since the offense was the responsibility of the tank, most artillery should be consigned to the defense. The experience of the Second World War rapidly changed perceptions, and the self-propelled gun soon became critical equipment in all major armies after 20 wasted years.

4. Stripping of Firepower from the Wehrmacht. The *Wehrmacht* grossly underestimated the importance of firepower in the crucial years 1940 and 1941 with dire consequences. It was stripped of much of its firepower in the misplaced belief that rapid armored maneuver would win the war by the end of 1941. The Germans' neglect of air power and artillery and their inability to deliver sustained firepower throughout the theater of operations proved fatal to them in the USSR.

From May to September 1940 in the Battles of France and Britain, the *Luftwaffe* lost 3,064 aircraft, 65 percent of its force. In September 1940, the month that Germany lost more planes than it produced, Hitler ordered planned aircraft production cut; that year British aircraft production outstripped Germany's. Between July and December 1941, the USSR produced 5,173 fighters and the Germans 1,619. The Germans fought the last four years of the war with inferior close air support and without a full-fledged strategic air force.'

Changes in artillery production and deployment illustrate the same point. In the summer of 1941, the Soviets and Germans had roughly 6,000 and 7,000 guns, respectively. The Germans broke their corps artillery into divisions, believing the artillery above the division level could not keep up with the speed of maneuver and cover the huge space of the USSR. This proved to be the case, but without self-propulsion, even the



M7 105-mm Howitzer in the Second World War. The self-propelled gun soon became critical equipment in all major armies.

Continued on Page 30

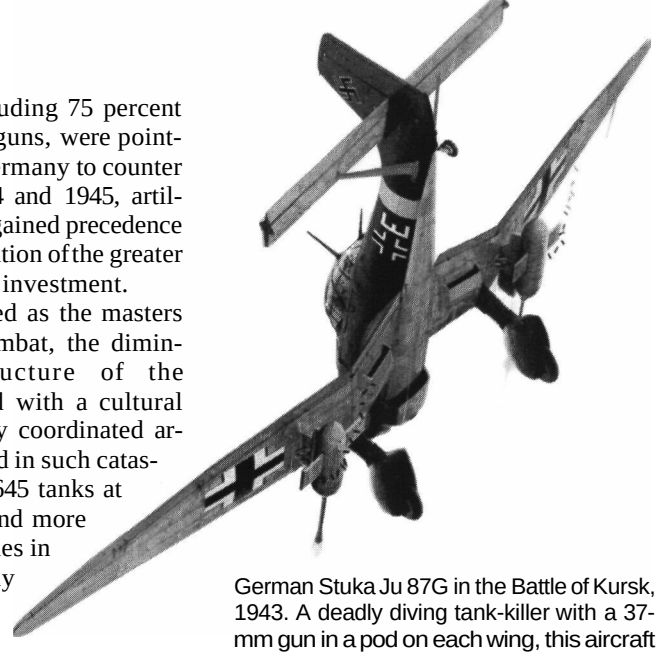
divisional artillery was often left behind. Air power proved an inadequate substitute, and the Germans failed to gain territory without the appropriate firepower.

The Germans failed to develop self-propulsion earlier and concentrate their artillery decisively in 1941 and thereafter. At the same time, their priority was tank production because the tank was to be the campaign winner, as it had been in France. In July 1941 as Operation Barbarossa was launched, a 70-percent cut in artillery production was ordered, and between April and December 1941, funding for artillery ammunition was reduced from 69.1 Reichsmarks to 15.7 Reichsmarks. By December 1941, artillery ammunition production was falling fast.[2]

In contrast, the Soviets increased artillery production and deployment at all levels in July 1941, creating new "operational" artillery formations above the divisions. The Soviets learned from the First World War and, in part, from the ideas of German Artilleryman Colonel Georg Bruchmueller that they had to have firepower to win.[3]

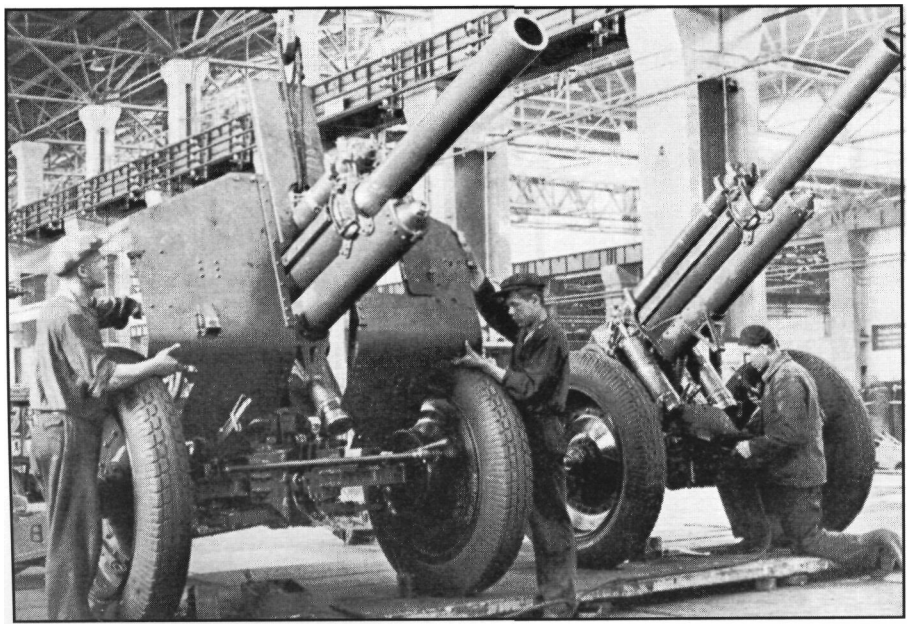
From 1 to 14 November 1941, the Soviets reinforced their Western Front with 2,000 guns as German artillery production was declining. By 1943, the Germans realized their error and tried to copy the Soviet artillery structure with *Artillerie Division 18,* but it was too late.[4] Resources to equip it were lacking, and by then, nearly one million men and 55,000 guns, including 75 percent of Germany's 88-mm guns, were pointing at the skies over Germany to counter aerial attacks. In 1944 and 1945, artillery production again gained precedence over the tank in recognition of the greater combat power for the investment.

While often portrayed as the masters of combined arms combat, the diminished artillery structure of the *Wehrmacht,* combined with a cultural predilection for poorly coordinated armored assaults resulted in such catastrophes as the loss of 645 tanks at Kursk in July 1943 and more than 600 in the Ardennes in December 1944.[5] Many studies have explained the excellence of German all-arms cooperation at the tactical level, but the failure to fight an effective all-arms battle at higher levels is less often noted; if the failure is noted, it's explained merely in terms of political interference. The failures usually are seen as symptoms of Germany's logistical weakness and ignore the fact that the imbalance between the arms was a conscious procurement decision based on skewed doctrine.



German Stuka Ju 87G in the Battle of Kursk, 1943. A deadly diving tank-killer with a 37-mm gun in a pod on each wing, this aircraft was very effective in Russia, but the Germans had too few to make a significant impact.

Challenging the First World War Myths. The essence of the myths of the First World War is based on the conditions on the Western Front: Millions died because the war was conducted by commanders wedded to monstrous, static, attritional tactics to win a few yards of shattered mud across trench lines that scarcely moved in five years. The horror only ended when the innovative Germans introduced "Stormtroop Tactics," revealing the primitive folly of earlier Allied offensives, and the tank was introduced to smash through the German lines leading to an Armistice. Almost none of the above is sustainable.



Manning arms plants hundreds of miles apart, Soviet workers assemble howitzers during the Second World War. Josef Stalin called his artillery the "god of war" and saw to it that his forces had more artillery than the Germans.

The tragedy allegedly was compounded by the fact that only the Germans learned the true lesson of this war—the need for a coherent armored doctrine. The Allies paid the price for their complacency with the German victories in 1940 and 1941, and thereafter, the tank dominated war on both sides. This view is also dubious.

The myth of military bungling emerged, in part, in the 1920s, is the reaction of liberal societies against their recent catastrophe and was reinforced by academics and the popular culture of the 1960s for whom this line struck an attractive chord.[6] The notion that there was an alternative to the horrors of the First World War was encouraged by the Nazi propaganda machine that invented the *Blitzkrieg Legende* and has been accepted uncritically by many since.[7] Such was the basis of the First World War myths, as follow.

• *Operations were typically static.* The First World War was only static for relatively limited periods and then primarily on the Western Front; elsewhere this was generally not the case. In the west, 1914 was predominantly a year of ambitious German and French maneuver, while 1915 to 1917 was indeed cha-

racterized by static trench warfare. For the Allies, this was not the tactic of choice but an unwelcome prelude to the breakout and maneuver. In 1918, the latter was achieved and the war concluded.

Speeds of advance were similar to those of the Second World War, given the relatively primitive means of mobility. For example, the Allied advance in Italy from September 1943 to May 1945 was 25 miles per month and in Normandy from June 1944 to February 1945 was 50 miles per month. In France from August to November 1918, five British Armies advanced at 30 miles per month. The war, even on the Western Front, was thus not one of unrelenting static operations, even when compared to operations 30 years later.

• *Static operations are more costly than mobile ones.* Were the high casualty rates of the First World War a consequence of static operations? The tactics of the day are said to have been both fatally concerned with capturing a few yards of mud and, at the same time, unduly concerned with attritional force-on-force confrontations. Yet periods of relatively static operations were not more costly than the periods of maneuver, but rather the reverse—with the casualties due to maneuver spread over a larger area of the battlefield. The measure of success should be whether the cost of the desired outcome was optimized.

There were probably as many decisive static operations as ones of decisive maneuver, and the latter were more costly. The disastrous French maneuvers of the summer of 1914 cost 955,000 casualties, and that year the Germans suffered 370,000 casualties on the Marne and at Ypres alone. The much-lauded German operational maneuvers of spring 1918, which so embarrassed the Allies, proved expensive disasters. Between March and July 1918, the Germans probably sustained one million casualties and another 500,000 men deserted.[7] Between July 1918 and the Armistice, they probably lost another 760,000 and a further one million refused to serve or deserted.[8] By comparison, they probably lost 500,000 in the static Battle of the Somme and 350,000 in the Battle of Verdun in 1916."

Static operations and maneuvers do not appear to have been inherently more decisive one than the other. The war ended with a successful maneuver following what the German High Command identified as a decisive period of attrition, which might be seen as the Allies "winning the fire fight"—the familiar ingredient in sustained success.

Germans on the Front in the First World War. Elite German Stormtroopers were created at the expense of the rest of the army in an infantry innovation designed to lever a decisive advantage—a price that proved too costly with the defeat of 27 of the 36 assault divisions in July 1918. This left a relatively low-grade majority to struggle on until the Armistice.

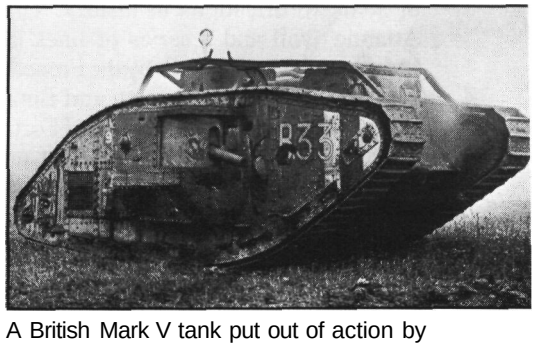
• *Tanks won the war in 1918.* The role of the tank in breaking the deadlock on the Western Front from 1916 onward is often seen as decisive. This was far from the case.

The tank was used spectacularly at Cambrai in November 1917, but its actions were less remarkable than firing the first predicted artillery fire plan and the innovative melding of aircraft and artillery operations. On 8 August 1918, the British Army successfully deployed 630 tanks, but thereafter the role of the tank diminished with only six occasions when more than 50 were massed and three when more than 100 were fielded. The tank's mechanical endurance was only about eight hours and its crew's endurance about two hours before motion sickness incapacitated the soldiers. Unlike horse-drawn artillery, tanks could not keep up in the fast-moving battles of the summer and autumn of 1918, and the burden of combat continued to fall on the artillery.[10]

• *German Stormtroop tactics and operations in 1918 were a success.* The German tactics often are regarded as a dazzling tactical innovation used with startling operational consequences." But the quality of these elite troops was bought at too high a price for the remainder of the German Army, and it's doubtful that anything worthwhile was achieved by their sacrifice.

The popular notion of *Schwerpunkt* in German doctrine acknowledges that relative weakness must be accepted in some areas to achieve a decisive strength elsewhere. A similar imbalance is often noticeable in German force structures, creating a well-furnished elite to lever a decisive advantage, albeit at the material expense of the majority of the force. Thus, Germany selected and trained Stormtroopers in 1916 and 1917, stripping the rest of the army of its best men. By July 1918, 27 of Germany's 36 elite assault divisions had been written off, leaving a relatively low-grade majority to struggle on until the Armistice.

The German Army's tactical "successes" in 1917 and 1918 often have been attributed to infantry innovation. But the system for the delivery of fire devised by Georg Bruchmueller was more significant. The mass of the German Army that assaulted Allied lines in the spring 1918 did so in primitive style. Not surprisingly, their casualties were comparable to those of Allied attackers in 1916. In many cases, the scale of their catastrophe may be attributed directly to their infiltration tactics, which caused thousands to be enfiladed by machine-gun posts, cut off and captured.[12]



A British Mark V tank put out of action by the direct fire of a German "77" in the First World War. Although the tanks of this war had a mechanical endurance of about eight hours, the crews had incapacitating motion sickness after about two.

In the spring of 1918, the German Army led by its elite formations never achieved an operational breakthrough. The *Amerika* Plan designed to win the war before the US Army could arrive in Europe in strength failed, guaranteeing that Germany would suffer strategic defeat in 1918 rather than 1919.

• *The First World War commanders typically were stupid and inflexible.* By today's standards, many of the commanders had an unacceptably high tolerance of casualties. This was the result of their refusal to acknowledge the strength of modern defensive technology and the demand for self-sacrifice by troops maneuvering in the face of it. The quality of these same commanders was apparent when they changed their approach, creating the revolution in military affairs (RMA) described in my first article. They were perhaps the greatest innovators in military history.

• *The Germans learned the right lesson from the First World War, and the French got it wrong.* It is often held that the Germans were successful with the *Blitzkrieg* while the French executed the folly of the Maginot Line and the *Bataille Conduite.* This is a false comparison. The French imperative was to deter and defend, avoiding another war with Germany. The Germans designed a force to win a war they intended to initiate, an offensive.

The fair test of whether the French were wrong and the Germans wise, is one that demonstrates whether or not the Germans would have adopted a different approach to that of the French if their imperative had been to defend. From 1941, defense was the German imperative in the west and, shortly after that, in the east as well. In the defense, the Germans proved themselves probably the greatest planners and builders of static fortifications in history. The Atlantic Wall and a series of lines in Italy dwarf anything built by the French. The German forts at Breslau and Boulogne were as much recreations of Forts Vaux and Douaumont as anything on the Maginot Line, and they possessed curiously puny firepower.

The paralysis that gripped the German decision makers in the days after D-Day in 1944 is similar to that which beset the French in the crucial moments of May 1940 when their linear defense failed and the enemy appeared on an unexpected flank. The German strategic and operational leadership, which had seemed so deft and decisive when it held the initiative in the offense in May 1940, looked anything but that in the defense in June 1944.

German tanks with armored cars regroup in Russia at the Battle of Kursk 1943. The human catastrophe at the hands of well-orchestrated Soviet and Allied firepower is seldom laid at the feet of the German's fatal, armored offensive doctrine—another Cult of the Offensive.

It is not that the Germans' approach in 1940 was right and the French wrong, rather they were approaches to different strategic objectives. In admiring the German military approach, the unwary also are paying tribute to its flawed strategic imperative. Their success in 1940 was often in the balance, and the decisive factor was the distinctive German style of command and risk taking, admirable no doubt at the tactical level but generally unacceptable in a democracy at any other.

• *The futile operations of the First World War were worse than those of maneuver in the Second World War.* After the First World War, the *Wehrmacht* was designed to fight a war on different terms. The error was not in a misreading of the fundamentals of the First World War, but rather, having identified them very clearly, in the determination to substitute rapid maneuver for fire superiority, repeating the intellectual errors of 1905 to 1914.

The emphasis was on maneuver by an armored elite to win a quick victory at low cost rather than the provision of sustained firepower in decisive time and space. Despite many misgivings and helped by extreme good fortune, the flawed German approach was fatally endorsed by the victories of 1940. The underlying fundamental, the ascendancy of firepower, became evident soon after, over-ruling wishful thinking. The Germans were fated to refight their military anathema, while woefully ill-equipped and configured to succeed.

The Second World War was to be even more costly for Germany than the first, and its campaigns more attritional. But because the campaigns initially involved dramatic maneuver, the human catastrophe at the hands of well-orchestrated Soviet and Allied firepower is seldom laid at the feet of the German's fatal, armored offensive doctrine—another Cult of the Offensive.

From 22 June to 26 August 1941 in Operation Barbarossa, the successful maneuver by which the *Wehrmacht* forced its head into the Soviet noose, the Germans suffered 440,000 casualties, a rate seldom seen in the First World War. By December, German casualties had reached 830,000. This was an operational disaster of greater magnitude than Verdun, ensnaring the Germans in a *Materialschlacht* far exceeding that of the First World War." After 1942, much of the fighting on the Eastern Front degenerated to a primitive, low-technology, static warfare typical of the middle years of the First World War for which the Soviet doctrine based on fires was configured to fight.[14]

German planning had been based not on military calculation, but rather the ideological conviction that, as Hitler put it, "Kick in the door and the whole rotten edifice will fall down," and German maneuver doctrine had been an accomplice to this error. Its devotion to the unbalanced doctrine of lightning armored warfare was ultimately the undoing of the *Wehrmacht.*

• *The First World War doesn't matter to us now.* Today's concepts for the delivery of fires were founded on operations in the First World War. Two-

dimensional warfare, the direct fire contact battle, had been the style of warfare for millennia until 1917 and 1918. Thereafter, the ability to deliver fire indirectly through the third dimension to fight the deep battle as well the close battle revolutionized warfare; and the delivery of joint fire at the decisive time and place has been the dominant theme in warfare ever since. The lines of its development also have been strikingly constant, with ever-improving acquisition; range; stand-off capability; precision; command, control, communications and intelligence (C^3I); and terminal effects. The manner in which fires are delivered today and the appearance of the wars and engagements in which they are used look very different than those of 80 years ago, but these are appearances rather than underlying concepts. Another dimension may emerge making Cyber War the dominant method of warfare; but in the near future, it will probably serve merely to make three-dimensional warfare in its various forms more efficient.[15]

The Evolution of Military Technology. There is an apparent pattern in the evolution of military technology: First, the military utility of a technical development is noted and usually found wanting; sometimes the concepts of those employing it are scorned as being excessively ambitious or mistaken. For example, the Germans were offered a form of radar in 1916 but turned it down because it needed at least six months more work.[16]

The moment arises when someone has the foresight to transform a technical capability into a system, and it becomes a dominant technology rather than merely a piece of clever science. This pattern applies to indirect fire: it had been demonstrated before 1914; by 1918, it had become the decisive system of war and has remained so today as joint fire in many different forms. The US forces' current efforts to systematize the "digit" also fit this pattern.

In time, the disproportionate effects of a system diminish and others supersede it. The figure displays this phenomena in the evolution of military technology. Strategic artillery is likely to remain a dominant factor in warfare. But in the future, the distinction between tactical, theatre and strategic artillery, as between the close, deep and rear battles, will disappear as even more capable ground fires are integrated with air fires in simultaneous attacks.

In the 20th century, the balance of capability has tilted in favor of fire over maneuver, and sustained success has most often been achieved when maneuver is synchronized with decisive attack by fire. There have been examples in

	American Civil War	Franco-Prussian War	Russo-Japanese War	First World War	Second World War	Cold War	Future ?
Experimental Use	Long-Range Rifle Rail Transport	Machine-Gun	Indirect Artillery	Tanks Strategic Artillery Chemical Weapons EW Air	Nuclear Weapons Helicopters TGM	Attack Helicopters	Cyber-War Genome Kampf
Flawed Immaturity	Long-Range Rifle Rail Transport	Machine-Gun Rail Transport	Indirect Artillery Machine-Gun	Indirect Artillery Tanks Chemical Weapons Internal Combustion EW Air	Strategic Artillery Nuclear Weapons CAS BAI AI	Biological Warfare Helicopters TGM	Cyber-War
Maturity	Rail Transport Muzzle-Loaders Bayonet	Long-Range Rifle Rail Transport Bayonet	Long-Range Rifle Rail Transport Bayonet	Long-Range Rifle Machine-Gun Indirect Artillery	Tanks Internal Combustion EW CAS Strategic Bombing	Tanks Strategic Artillery Chemical Weapons Nuclear Weapons Tpt Helicopters EW, BAI, AI Information Warfare	Strategic Artillery Chemical Weapons Biological Warfare Nuclear Weapons Attack Helicopters TGM
Dominance	Muzzle-Loaders		Long-Range Rifle Bayonet	Long-Range Rifle Machine-Gun Indirect Artillery Rail Transport	Indirect Artillery Rail Transport	Tanks Strategic Artillery Internal Combustion EW CAS BAI Strategic Bombing	Strategic Artillery Nuclear Weapons Internal Combustion EW Information Warfare BAI AI TGM
Diminution		Muzzle-Loaders		Long-Range Rifle Bayonet	Machine-Gun	Indirect Artillery Rail Transport	Tanks Internal Combustion CAS

Legend:
AI = Air Interdiction
BAI = Battlefield Air Interdiction
CAS = Close Air Support
EW = Electronic Warfare
TGM = Terminally Guided Munitions
Tpt = Transport

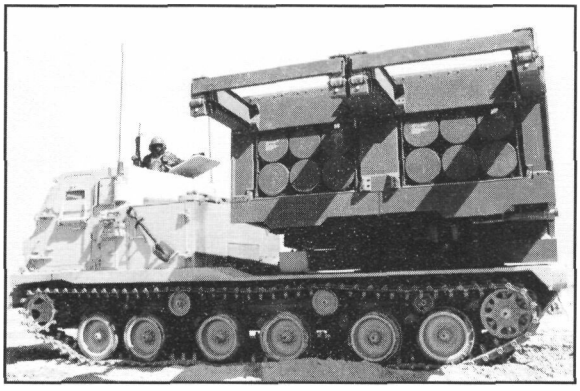
3d Warfare Revolution
Indirect Fire

4th Warfare Revolution
Information Warfare

The Evolution of Military Technology

20th century warfare where *coup de main* operations or dazzling, but poorly supported, ground maneuver have succeeded. Such operations and campaigns have tended to be highly risky and often have not been sustainable or successful in the longer term, leading to disaster.

Equally, there have been examples where sudden attack by fire alone has proven decisive. The means to generate firepower, however, is not of itself enough to guarantee success—as was shown in Vietnam. Misapplied, firepower even may be counter-productive.



VII Corps Multiple-Launch Rocket System in Operation Desert Storm. Desert Storm achieved outstanding success through the application of meticulous joint fires in conjunction with maneuver.

Success requires the application of decisive fire harmonized with maneuvers focused on achievable strategic objectives. An operation such as Desert Storm achieved outstanding success, primarily through the application of meticulous joint fire planning in conjunction with maneuver and a clear strategic direction. The overwhelming evidence supports a formula that is so orthodox as to need little advertisement: win the fire fight decisively and, thereby, gain the freedom of action to exploit it with maneuver in the most effective manner to conclude the matter at optimal cost.

An astonishing aspect of warfare this century has been that military establishments have frequently resisted this conclusion in defiance of the evidence and neglected to develop their capacity to deliver fires, denying their self-evident lethality, preferring instead to construct models that might obviate these facts. This often has been in response to strategic direction and the inclination of military cultures that tend to favor ground maneuver. Wishful thinking often failed to match the actual technological capabilities of the day, and many were distressed when their doctrinal constructions were revealed as lethally flawed, creating worse outcomes than the paradigms they were seeking to avoid.

In a familiar pattern, the dominance of fires tends to reassert itself in combat, ground maneuver proves too attritional and forces are restructured in wartime to reflect this. Thus what should be regarded as orthodox in 20th century warfare has more often been regarded as regressive and heretical in peacetime.

Happily there is an increasing congruence in Western societies between their technological capability to generate firepower and their desire not to commit troops unnecessarily to attritional ground maneuvers and short-range combat with the enemy, which were so often the objectives of doctrine and the causes of disaster in the past. Today, it is fires or "fire maneuver," not ground maneuver, that is the "Maneuverist" in the sense of leveraging combat power, undermining an enemy's will and avoiding attrition to friendly forces.

In this century, ground maneuver too often has been seen as the best means of avoiding close combat and its ensuing casualties. Today, we should be cautious lest "fire maneuver" be propounded in the same manner, and we should not underestimate the efficacy of "boots on the ground" or the need, on occasion, to close with the enemy. However, a doctrine based on the application of firepower is likely to prove the most suitable for Western societies; and the confidence to assert this comes from the bitter experience of the 20th century and the tragic cost of ignoring that evidence.

Brigadier Jonathan B. A. Bailey, Member of the British Empire (MBE), is the Chief of Fire Coordination for the Allied Command Europe Rapid Reaction Corps in Germany. He commanded the 40th Field Regiment in Germany and a battery in the 4th Field Regiment of the Royal Artillery. He also served as a Tactics Instructor and member of the Directing Staff at the Staff College in England, from which he is a graduate, and as the Artillery Operations Officer for the 4th Armoured Division in Germany. Other highlights of his service in the British Army include commanding a Zipra guerrilla Assembly Place in Rhodesia as part of the Commonwealth Cease-Fire Monitoring and serving as an Operations Officer and Battery Commander during the Falklands Campaign. Brigadier Bailey is a graduate of the Higher Command and Staff College. He has written a number of articles and books on the subject of artillery and military history.

Notes:

1. D. Irving, *The Rise and Fall of the Luftwaffe. The Life of Erhard Milch'* (London: Weidenfeld and Nicholson, 1973).
2. J. Ellis, *Brute Force* (London: A. Deutsch, 1990), 46-48. In December 1941, Germany produced 9,000 light howitzer shells but consumed 1,260,000, See J. Engelmann, *German Artillery in World War II* (Atglen, PA: Schiffer, 1995), 112. Many statistics about artillery are confusing because self-propelled gun production is often grouped with that of tanks.
3. Bruchmueller's work was brilliantly described by David T. Zabecki in *Steel Wind: Colonel Georg Bruchmueller and the Birth of Modern Artillery* (Westport, CT: Praeger Publishers, 1994); Soviet Marshal F. I. Kulik asserted that tanks were "a sheer waste out of which the artillery would make scrap," as quoted from E.F. Ziemke, "The Soviet Armed Forces in the Interwar Period," *Military Effectiveness,* Edited by A. R. Millett and W. Murray (Winchester, MA: Allen and Unwin, 1988), 32.
4. Jonathon B. A. Bailey, *Field Artillery and Firepower (London:* Oxford Press, 1989), 221 -222.
5. Ibid., 200-206.
6. M. Stephen. *The Price of Pity* (London: Leo Cooper, 1996).
7. K-H Frieser, *Blitzkrieg Legende* (Muenchen: Militaergeschichtliches Forschungsamt im R Oldenbourg Verlag, 1995).
8. T. Travelers, *How the War was Won: Command and Technology in the British Army on the Western Front 1917-18 (London:* Routledge, 1992), 154-157.
9. Casualty figures for the First World War are wildly inconsistent and require further research. Those given in this article reflect recent estimates, it's interesting to note that the worst casualties were sustained on the mircrobial front with 25 million deaths in 1918 and 1919 attributed to the great influenza epidemic. G. Noon, "The Treatment of Casualties in the Great War," *British Fighting Methods in the Great War* (Ilford Essex: P, Griffith, 1996), 209-227.
10. Bailey, 209-227.
11. Bruce Gudmundson has described the evolution of German thinking, organizational change and practice in *Stormtroop Tactics,* (Westport, CT: Praeger Publishers, 1989.) The French were influenced by similar innovative infantry tactics, devised by Andre Laffargue as early as May 1915, although these were not implemented systematically. The British included such tactics in their platoon training manuals as early as February 1917 to be practiced by all. See P. Griffith, *Battle Tactics of the Western Front,* (New Haven, CT: Yale, 1994), 194.
12. The evidence is taken from the battle between the British 55th Division at Givenchy facing four German divisions on 9 April 1918. The band instruments were collected later as trophies.
13. Ellis, 72.
14. O. Bartov, *Hitler's Army* (Oxford, England: Oxford University Press, 1992), Chapter 1.
15. R. J. Bunker has speculated about a BlackFor Cyber-State as an opponent, challenging the view of the US Department of Defense that ".. .the strategic environment of 2020 will be much like that of 1997." See, *Five-Dimensional (Cyber) Warfighting,* SSI Paper. (US Army War College, Carlisle Barracks, PA, 10 March 1998), 3. The diversification of warfare rather than dominance of Cyber War is the most likely development in the coming decades
16. W. Murray and A. Millet (ed.), *Military Innovations in the Interwar Period* (Cambridge, England: Cambridge, 1996), 268.

FA Journal

A Professional Journal for Redlegs

March-April 1999 Volume IV, No. 2

INTERVIEW

IET: Starting the Soldier Out *Right*
Interview with Lieutenant General William J. Bolt, Deputy Commanding General of the Training and Doctrine Command (TRADOC) for Initial Entry Training (IET)

ARTICLES: Initial Entry Training

10 So...You Want to be a Drill Sergeant?
by Sergeant First Class Thomas M. Easterly

12 Honor, Courage, Commitment: Transformation to a Marine
by Captain William P. Rayfield, USMC

15 Redleg Mentor Program: Sharpening the Sword, Nurturing the Spirit
by Lieutenant Colonel Britt E. Bray and Major William M. Raymond, Jr.

22 Rites of Passage: Civilian to Soldier
by Lieutenant Colonel George W. Steuber

24 A Day in the Life of a Basic Trainee

40 Army Values and Basic Training
by Lieutenant Colonel Michael A. Byrd

46 OCS Hall of Fame
by Captain Larry D. Pool

50 OBC: Training the New Lieutenant
by Captain Ferdinand Burns III

ARTICLES: Feature

7 3x6 Operations in the Paladin Battery
by Lieutenant Colonel Stephen D. Mitchell and Captain Patrick D. Quinn III

17 Fire Support Planning for the Brigade and Below
by Major David A. Lee and Colonel John A. Yingling

26 Part ll: The Century of Firepower
by Brigadier Jonathan B. A. Bailey, MBE

36 The FA Wargame Synchronization Matrix
by Lieutenant Colonel Patrick J. Sweeney

41 Deliberate NFA Sizing for Combat
by Major Rodney L. Lusher

47 Training and Maintaining AFATDS the Red Team Way
by Colonel David C. Ralston and Captain Thomas R. Bolen

DEPARTMENTS

1 FROM THE FIREBASE 52 ASSOCIATION NEWS

Front Cover: SFC Thomas M. Easterly is Drill Sergeant of the Year for the FA Training Center (FATC) at Fort Sill, Oklahoma. He won the award while serving as Drill Sergeant in D/2-80 FA. Currently, he is the Senior Drill Sergeant for the Cadre Training Course at FATC.

***Field Artillery Bulletin* Staff:**

Patrecia Slayden Hollis
Editor

Linda Bitter
Assistant Editor

Bob T. Coleman
Art Director

PURPOSE: As stated in the firsl *Field Artillery Journal* published in *IQ11-~To publish a journal for disseminating professional knowledge and furnishing information as to the artillery's progress, development and best use in campaign; to cultivate, with the other arms, a common understanding of the power and limitations of each; to foster a fee/ing of interdependence among the different arms and of hearty cooperation by all; and to promote understanding between the regular and militia forces by forging a closer bond; alt of which objects are worthy and contribute to the good of our country.*

SUBSCRIPTIONS/ASSOCIATION MEMBERSHIP: Subscriptions to the FA Jouma/come with membership in the Association, individual or corporate memberships may be obtained through the US Field Artillery Association, P.O. Box 33027, Fort Sill, Oklahoma 73503-0027. Telephone numbers are (580) 355-4677 or FAX (580) 355-8745 or Email: usfaa@sirinet.net. Dues are $20.00 per year for an individual membership ($38.00 for two years and $56.00 for three) to US and APO addresses. All others add $13.00 per subscription year for postage. Corporate Memberships are available at $700.00 per year and Corporate Associate Memberships are $350.00 per year.

SUBMISSIONS: Mail FA or fire support-related articles to *Field Artillery,* P.O. Box 33311, Fort Sill, Oklahoma 73503-0311 [DSN 639-5121/6806 or commercial (580) 442-5121/6806 or FAX DSN 639-7773/commercial (580) 442-7773 or Email famag@usafas.arrny.milj. Articles are subject to edit by the *Field Artillery* staff; footnotes may be deleted due to space. Mail Association chapter news, reunion news and other such information to the FA *Journal,* US Field Artillery Association, P.O. Box 33027, Fort Sill, Oklahoma 73503-0027 [(580) 355-4677 or FAX (580) 355-8745 or Email: usfaa9sirinet.net).

REPRINTS: The US Field Artillery Association is pleased to grant permission to reprint articles. Please credit the author and the *FA Journal.*

ADDRESS CHANGES: Members call or write the Association at the telephone numbers/Email listed in "Subscriptions" or the address listed below. Third-class postage paid by the US Field Artillery Association, P.O. Box 33027, Fort SB, Oklahoma 73503-0027. POSTMASTER SEND ADDRESS CHANGES to the Association at the same address.

Redleg Hotline
(Organization, Materiel, Doctrine and Training)
DSN 639-4020 or (580) 442-4020 (24-Hour)

Tactical Software Hotline
DSN 639-5607 or (580) 442-5607 (24-Hour)

Fort Sill Home Page
http://sill-www.army.mil/index.htm

FA Branch at PERSCOM
http://www-perscom.army.mil/opmd/fasitrep.htm
http://www-perscom.army.mil/enlisted/fajtr.htm

DAVID E. OTT
Lieutenant General, US Army, Retired
President, US Field Artillery Association

US Field Artillery Association Staff:

Anna Lou Johnson
Managing Director

Mary C. Hill
Circulation/Address Changes