Riga, Latvia, on 3 September 1917, the day of the German conquest. The Battle of Riga was the last major campaign on the Eastern Front before Russia's provisional government began disintegrating. (Illustration from Hans W. Schmidt in *Illustrated History of the World War 1914–1918* [in German], vol. 7 [Union Deutsche Verlagsgesellschaft, 1918], via Wikimedia Commons)

The Battle of Riga

A Case Study for Successful Breakthrough Operations

Capt. Randy Noorman, Royal Netherlands Army

The key points of judgement for the higher headquarters as regards combat will be where to apply their limited number of penetrating ISTAR assets to understand the enemy deep, where to apply long-range fires to shape the enemy, and when the balance between sensors and fires has met the conditions for committing a concentrated force.

—Jack Watling

On 1 September 1917, the German Eighth Army under the command of Gen. Oskar von Hutier conducted one of the most successful breakthrough operations of the First World War while crossing a major river about twelve miles to the southeast of Riga, Latvia. The attack began with over 1,100 guns, howitzers, and mortars conducting a very intense and complicated preliminary bombardment that lasted just over five hours, during which over half a million shells were fired at Russian positions. This was followed by three divisions crossing at three different sites on a front nearly six miles wide.[1] Preceded by specialized assault detachments called *Sturmtruppen* (stormtroopers) and supported by the highly effective artillery bombardment, these divisions were quickly able to overcome the initial Russian defenses. However, this was just the first echelon, and within just forty-eight hours, a total of nine German divisions, divided into three different assault echelons, had crossed the 300- to 400-meter-wide river. On the morning of the third day, German troops entered Riga basically unopposed. Although the majority of the Russian Twelfth Army managed to escape the encirclement, the German victory was unprecedented at the time and served as a blueprint for Germany's *Kaiserschlacht* (Kaiser's battle) on the Western Front in the spring of the following year.[2]

The Battle for Riga is an interesting case study for comparison to the current dilemma facing both the Russian and Ukrainian, as well as Western, armies of overcoming the consequences of the so-called "transparent battlefield."[3] Although the transition from combat distributed along a contiguous front into the tactical and operational depths of the adversary is a process that only fully came into being with the development of the *deep battle* and *deep operation* within the Red Army during the interwar period, there are still important parallels between current battlefield conditions in Ukraine and the tactical difficulties in fighting through the elaborate defensive systems of the First World War.[4] In a recent article, retired Maj. Gen. Mick Ryan also emphasized the difficulties in conducting a contested river crossing operation and hinted at possible Russian river crossing attempts in the near future.[5] Beside this interesting possible prospect, however, the primary goal of this article is to use the Battle of Riga as a means to demonstrate that the German responses to the problem of breaching in and fighting through a defense in depth, on a conceptual level, though much more rudimentary, are not dissimilar to those necessary under modern conditions. To this end, this article will compare the highly successful Riga offensive with the failed Ukrainian counteroffensive in the summer of 2023 to identify the parallels that can provide insights into how to potentially find a way out of the current tactical stalemate in Ukraine.

The Tactical Dilemma

Although defense is usually regarded as the stronger form of warfare, the main reason offensive actions can be successful is because an attacker can choose the time and place of an attack and establish a favorable correlation of forces. Historically, this was achieved mostly through mass. During the latter half of the nineteenth century, however, an important shift in the so-called offense-defense balance began to take place due to technological advancements that led to huge increases in firepower. Massive casualties suffered during offensive actions forced armies to disperse even more on the battlefield. Consequently, it became far more challenging to concentrate fighting power at the decisive point, making the defense even more dominant. In September 1914, an uninterrupted front line took shape across northern France (and,

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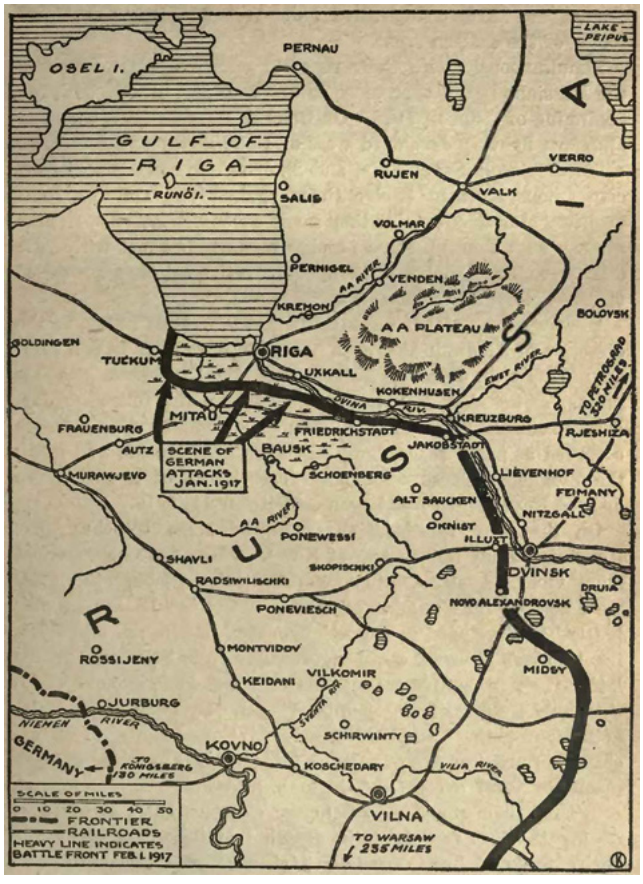


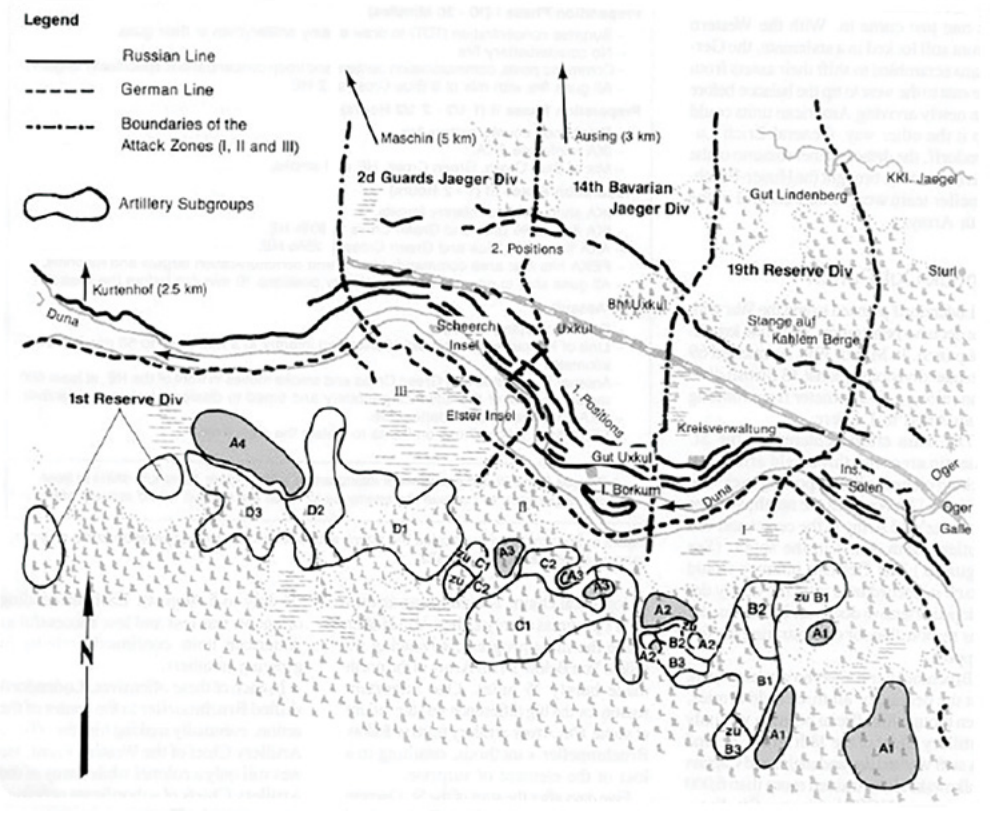
The map shows actions and positions during the German counteroffensive toward Riga after the Russian 12th Army offensive (Battle of the River Aa) from January to February 1917. (Map from Francis J. Reynolds, Allen C. Churchill, and Francis Trevelyan Miller, eds., *The Story of the Great War*, vol. 6 [John A. Collier & Son, 1919], via Wikimedia Commons)

due to its lower troop density, to a lesser degree on the Eastern Front), and in due time, defenses began to disperse in depth in response to the increasing lethality of artillery concentrated against densely packed troops in frontline trenches. As a result, the actual conduct of combat actions expanded from the traditional line of contact and came to include distributed combat actions across time and space.[6] From that moment on, an assault had to be conducted and sustained all the way through the entire depth of an enemy's tactical defense.

The main dilemma facing all belligerents during the First World War was thus how to enable maneuver through fire to overcome what Soviet theorist Georgii Isserson called a fire intensive front and prevent premature culmination of the attack across larger distances.[7] This is usually divided into three separate phases: breaking into the enemy's front line; breaking through the tactical depth of the enemy's defenses, which by itself could be multiple miles deep; and finally, breaking out in order to defeat the enemy's operational reserves.[8] Breaking in was not the main difficulty. Fighting through, however, would take the belligerents four years to achieve, while the methods for breaking out would not be realized until after the mechanization of warfare. Communication technologies during this time were simply not advanced enough to facilitate effective coordination between artillery, which was located at the divisional echelon, and the advancing infantry, which remained dependent on individual rifleman deploying in vulnerable linear formations. Consequently, all belligerents began searching for new ways and methods, as well as technological solutions, to reenable maneuver against a modern defense. These attempts led to the establishment of combined arms warfare on different tactical levels aimed at combining effects rather than mass. At higher echelons, numerous advancements were made in order to adjust artillery fire to the advancing infantry. The use of gas was one such attempt, as well as a method to increase and diversify the effects of existing artillery. The tank was another, developed to offer protected firepower to the advancing infantry. Meanwhile, the first developments in the conduct of tactical air support and air interdiction were made. Additionally, basically all armies experimented with specialized assault detachments to a certain extent.

The German Responses to the Tactical Dilemma

Despite eventually losing the war, it was the German army that would prove to be most successful in trying to overcome this tactical dilemma. Already in 1915, the *Oberste Heeresleitung* (OHL, or German High Command) ordered the establishment of a specialized assault formation to experiment with new weapons and tactics. It was to become the impetus for the creation of multiple so-called *Sturmbataillonen* (assault battalions), operating as training cadres and elite assault formations, as well as the formation of *Stosstruppen* (shock troop) detachments within regular infantry formations. By delegating heavy support weapons that would otherwise only be found at higher echelons down to lower tactical levels, stormtroopers could provide their own



Organization and Missions of German Artillery

Group		Sub-group	Mission	Batteries				
				Field Guns	Hvy Guns	Lt Field How	Hvy Field How	Hvy Arty Mortars
AKA	A	A1	Neutralize the enemy artillery.	5	5	-	2	-
		A2		6	-	-	1	-
		A3		7	1	-	-	-
		A4		7	1	-	1	-
IKA	B	B1	Lay fire on the first-line positions to prepare for assault in the 19th Reserve Division's attack zone.	4	-	8	6	3
		B2	Lay heavy fire on the second-line positions to prepare for the assault in the 19th Reserve Division's attack zone.	-	-	3	3	-
		B3	Lay down a fire barrier to the east.	9	2	-	-	-
	C	C1	Lay heavy fire on the first-line positions to prepare for the assault in the 14th Bavarian Jaeger Division's attack zone.	6	2	7	10	5
		C2	Lay heavy fire on the second-line positions to prepare for assault in the 14th Bavarian Jaeger Division's attack zone.	2	2	3	3	-
	D	D1	Lay heavy fire on the first-line positions to prepare for assault in the 2d Guards Jaeger Division's attack zone.	5	-	7	7	2
		D2	Lay heavy fire on the second-line positions to prepare for assault in the 2d Jaeger Division's attack zone.	1	-	5	3	-
		D3	Lay down a fire barrier to the west and provide fire support for the 1st Reserve Division in case of a Russian attack.	6	2	-	-	-
			Total	58	15	33	36	10

(Images from David T. Zabecki, "Der Durchbruchmueller," *Field Artillery* [August 1990])

Bruchmüller's Positioning of Fire Units Near Riga to Support the Attack on 1 September 1917

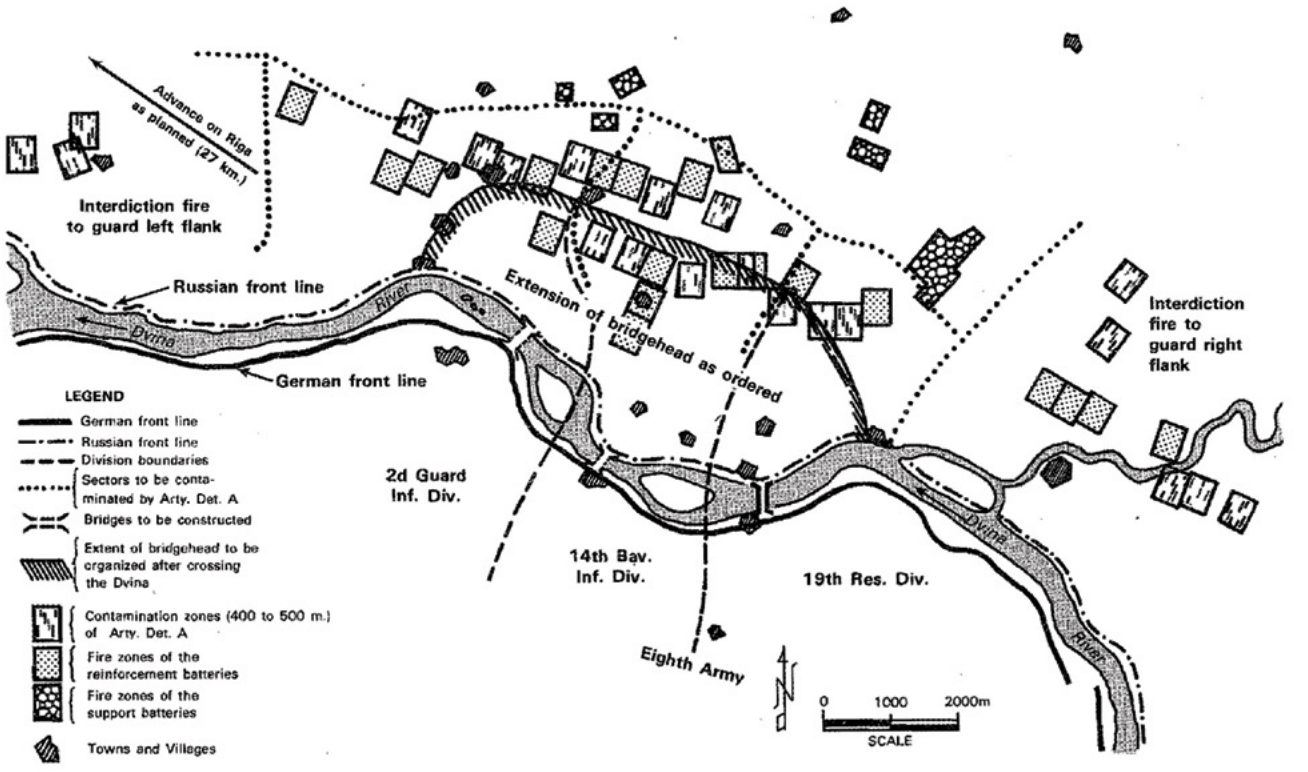
fire support and disband the vulnerable linear formations to instead operate in small mutually supportive groups, enabling them to exploit the terrain for cover and concealment during forward movement. Operating machine guns, rifle grenades, mortars, flamethrowers, and even small field guns, stormtroopers penetrated enemy defenses, bypassing strongpoints and disrupting the enemy's ability to resist from within its own rear area. Not surprisingly, this necessitated a strong degree of independence of action and initiative, or *Auftragstaktik*, which the Germans introduced to the lowest tactical levels accordingly.[9] At higher tactical echelons, several innovations led to greater effectiveness of artillery and improved coordination with the advancing infantry.

A key figure in developing new artillery tactics was Lt. Col. Georg Bruchmüller, nicknamed *"Durchbruchmüller"* [Breakthrough Müller], the German army's leading artillery officer, whose role and impact on the development of artillery tactics, then and now, cannot easily be overstated. Bruchmüller aimed not to destroy but rather to temporarily neutralize the enemy through shock to facilitate the stormtroopers' assault.[10] One of the first changes he applied was moving away from the prolonged preliminary bombardments conducted several days in succession. Not only did these not have the proper effect, but they also gave the enemy a clear understanding of where the assault would take place, eliminating the element of surprise. Instead, the duration of the bombardment was reduced to several hours, but with a much higher intensity through a concentration of (relatively) accurate fire. He successfully implemented the revolutionary "Pulkowski" method for predictive fire by calculating ballistics using mathematics, eliminating the necessity for the ranging of individual pieces and batteries prior to the bombardment, thereby further increasing the element of surprise.[11] Additionally, he extensively used gas shells containing different chemicals for alternating effects in order to incapacitate enemy artillery and seal off the breakthrough sector from enemy reinforcements.[12] Opposed to the decentralized employment of assault formations, these comprehensive and complicated artillery preparations required centralized command and control.[13]

The Battle of Riga

The defense of the Russian front near Riga was assigned to the Russian Twelfth Army under the command of Gen. Dmitri Parskii. Two of its corps, the II and VI Siberian, defended the Russian bridgehead on the western bank of the Dvina, which was where Parskii expected a possible German attack, mainly because this would enable the Germans to penetrate Russian defenses before crossing the river. The Russian XXI and XLIII Corps defended along the eastern bank of the Dvina, covering a front of more than sixty miles toward the southeast. The front section that the Germans actually selected for their assault, opposite the village of Üxküll, was defended by the Russian 186th Rifle Division, part of XLIII Corps. Being in between two revolutions, however, the Russian army was short on almost everything, including morale. Equally important, the Russians could muster only sixty-six artillery pieces for fire support within the intended breakthrough sector.[14] Nonetheless, Russian troops occupied strong natural defenses and constructed at least two successive lines of fortifications, each consisting of multiple trench lines. Therefore, to be successful, any German attack within this sector had to cross the river in full sight of Russian troops occupying higher ground before breaking into and fighting through the actual Russian defenses.[15]

For the upcoming assault, Hutier received significant reinforcements. The units that were to spearhead the assault spent up to two weeks behind the front rehearsing extensively the newly developed assault tactics that were applied at Riga for the first time on a grand tactical scale. His plan called for a short but intense artillery barrage during which the initial assault formations would cross the river and break into the Russian positions. They would then bypass enemy strongpoints and further infiltrate Russian defenses. The first echelon to cross the river would consist of the 2nd Guards Division on the left flank, the 14th Bavarian Division in the center, and the 19th Reserve Division on the right flank. At the same, time three other German divisions would stage a diversionary attack against the Russian bridgehead on the western bank of the Dvina to prevent Russian troops from retreating northward, out of the city. Once the initial bridgehead was secured, a pontoon bridge was to be built in each divisional sector, paving the way for the second and third echelons to cross. The ultimate aim was to envelop Riga before Russian troops could withdraw from the city and trap a large part of the Russian Twelfth Army inside.[16]

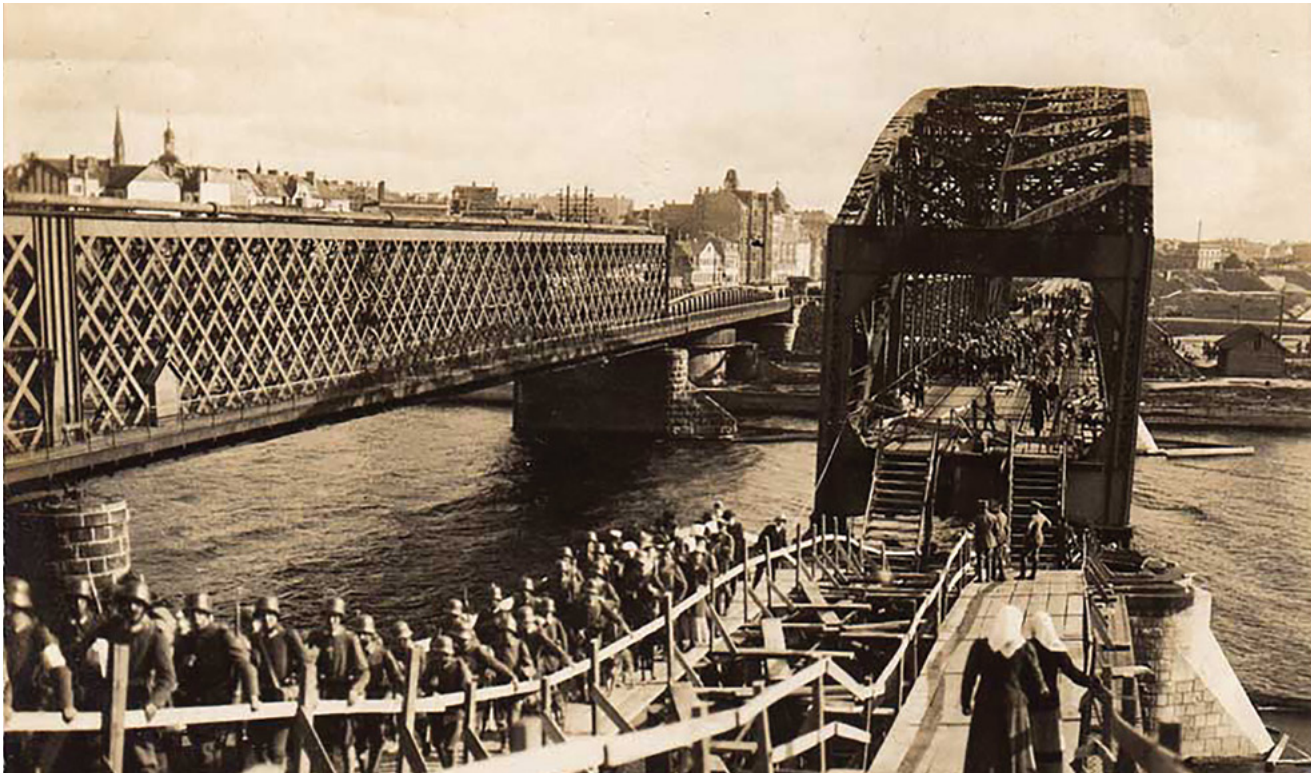


(Map from Charles E. Heller, *Chemical Warfare in World War I: The American Experience, 1917–1918*, Leavenworth Papers No. 10 [September 1984])

Zones of German Gas Fired (Gas Squares) in Support of a Crossing of the Dvina River before Riga, Eastern Front

Meanwhile, Bruchmüller was brought in to orchestrate the artillery. Centralization was a key element in his ability to plan and coordinate the bombardment effectively, and on arriving, he immediately gathered all available guns, howitzers, and mortars under his personal command, which previously operated primarily under divisional-level control.[17] The Germans had extensively reconnoitered the Russian defenses in advance using aerial photography, mapping trench systems and accurately locating artillery batteries, means of communication, and even command posts down to battalion level. To effectively coordinate its effects in time and space, the initial bombardment itself was divided into five different phases while the 152 artillery batteries were divided into task-organized groups, each with its own assignment within each phase. Some of these were tasked to fire "barrier barrages," sealing off the intended breakthrough sector in order to prevent Russian reinforcements from intervening.[18] Others aimed to suppress Russian artillery or were directed against infantry positions, creating so-called "gas squares" within which different types of gas shells were used with complementary effects.[19] Bruchmüller was thus one of the first to distinguish between the close and deep battles and to recognize the need to coordinate them.[20] All the while, preparations were masked by the near complete German air superiority and the heavily forested area of operations, which extended all the way up to the riverbank.

At 0400 hrs. in the morning of 1 September, the hurricane bombardment began with more than 1,100 tubes firing simultaneously along a front nearly ten thousand yards wide, achieving an average density of sixty-eight guns and howitzers and sixty mortars for almost every one thousand yards of front. The opening phase was primarily aimed against Russian artillery and, containing huge numbers of gas shells, achieved almost instant fire superiority within the selected breakthrough sector. After two hours, the emphasis shifted toward the Russian front lines, primarily using



German troops crossing the Daugava (Dvina) River in Riga via a railway bridge, which had been demolished by retreating Russians. (Photo courtesy of Wikimedia Commons)

high explosives, while dedicated batteries continued pounding Russian artillery positions. Finally, during the last twenty minutes, almost all available tubes, including relatively short-range mortars, joined the final barrage in preparation for the upcoming assault. In all, in just over five hours, the Germans fired more than half a million shells, enabling the assault formations to cross the river basically unhindered. Once they reached the other bank and broke into the first Russian trenches, the leading infantry units fired green flares, signaling the artillery to begin the creeping barrage, or *feuerwalze*, themselves following closely behind.[21] The Russian defenses, meanwhile, quickly began to falter.

During the next phase, the main difficulty was trying to combine fire and maneuver in such a way that the artillery was able to follow the infantry's rate of advance and not, as had been the case during previous battles, the other way around. Besides using green flares, Bruchmüller advocated the use of forward observers who would join the infantry units during the attack. They were accompanied by several telephone operators laying out telephone cables as the forward units advanced, relaying target information and the limit of the infantry's advance back to static observation posts along the front, further toward the rear, which in turn were connected to the artillery batteries.[22] Additionally, the Germans deployed airplanes with crews who were specifically trained to correct artillery fire through the use of Morse code radio messages, while fighter aircraft actively searched for approaching Russian airplanes. Even more innovative, three so-called "infantry planes" were allocated to each of the three assault divisions in the first echelon; their task was to report on the progress of the advance. Finally, dedicated ground attack planes carrying bombs and machine guns were tasked with attacking Russian troop concentrations behind the front.[23]

Each phase of the attack continued to be meticulously supported by artillery, all part of Bruchmüller's orchestration, dominating the battlefield to such an extent that Russian resistance soon crumbled and enabling German troops to move in company-size formations basically unhindered and in relative safety.[24] Once the Germans gained a proper foothold on the right bank of the Dvina, the lighter guns were allotted

back to divisional level and rafted across the river in order to support the advance toward the second Russian line of defense. The heavier guns, with longer effective range, continued to support the attack from the left bank.[25] Meanwhile, German engineers immediately began building three pontoon bridges, one in each division sector, and as a result, within twenty-four hours, six out of nine divisions had crossed the river.[26] Under this relentless assault, the Russian defense soon collapsed, and while a number of Russians surrendered, most units simply broke and ran, leaving most of their guns and heavy equipment behind. Parskii, commander of the Russian Twelfth Army, ordered several counterattacks to be undertaken; however, those actions were far beyond Russian capabilities at that moment. The German advance therefore continued virtually unopposed until it ran into the 2nd Latvian Rifle Brigade, which had managed to put up a hasty defense along a small river. This offered the Russians troops just enough time to abandon the city, albeit without heavy equipment, and formed the main reason the Germans could not fully exploit their initial success. Nonetheless, German troops entered Riga on 3 September, less than sixty hours after the operation had begun.[27]

The Fundamentals

The development of tanks and armored vehicles was another attempt to return mobility to the battlefield during the First World War, enabling troops to concentrate and maneuver under fire by offering mobile protection. Mechanization has since then led to nothing less than a transformation in warfare, both tactical and operational. Making a correct translation of the First World War's tactical dilemmas to the present is therefore not an easy accomplishment, particularly as battlefield capabilities of modern armies, as well as the battlefield itself, have again expanded significantly over the last decades. Currently, the proliferation and density of drones on the Ukrainian battlefield ensures that almost complete transparency is achieved along the front, extending multiple miles beyond the forward lines with decreasing density as it progresses.[28] Modern land-based strike weapon systems, meanwhile, can achieve a high level of accuracy and destruction at far greater distances. Although these developments generally favor the defender, enabling it to combine effects from dispersed locations, surprise and a physical massing of forces remain necessary preconditions for success during offensive actions. On a conceptual level, therefore, the primary tactical dilemma basically remains unaltered, because now, as then, it results in the inability of the attacker to achieve the necessary concentration of forces at the decisive point, which remains a key principle in warfare.[29] This is especially true when breaching linear obstacles, which is why the fundamentals of breaching operations—suppress, obscure, secure, reduce and assault—have become more relevant and presumably even more difficult to achieve.

Breaching operations are not that dissimilar to gap-crossing operations like the crossing of the Dvina River because, in either case, the attacker is forced to move through certain predetermined chokepoints at a relatively low speed, making the attacker extremely vulnerable. Success, meanwhile, depends on the attacker's ability to achieve the necessary mass once the obstacle has been crossed in order to conduct follow-on operations. The number of crossings or lanes thus determines the speed at which the attacker can generate sufficient combat power to continue the attack. During World War I, repelling an assault was in large part achieved through the mass employment of artillery batteries firing from relatively fixed, though possibly concealed, locations. Nowadays, however, the available assets to accomplish this are much more diverse, mobile, and effective and therefore able to concentrate effects while operating from dispersed positions.

Successful assaults require suppressing the enemy's fires that can affect the forces conducting the breach or crossing through effective targeting and obscuration, including electronic attack. However, the complex distributed nature of a modern defense complicates the attacker's intelligence gathering process and targeting cycle. Besides blocking enemy reinforcements or counterattacks, securing these chokepoints also requires establishing air defenses against enemy drones and attack aviation. Meanwhile, while the assault is underway, shaping the battlefield in the depth of the enemy's defense is crucial to retain momentum following the breach or crossing.[30] These are complex operations that depend on centralized battlefield management to integrate and synchronize all available sensors and fires at higher echelons in order to disrupt the enemy's sensor-to-shooter links and set the conditions for a the deployment of a concentrated force.[31]

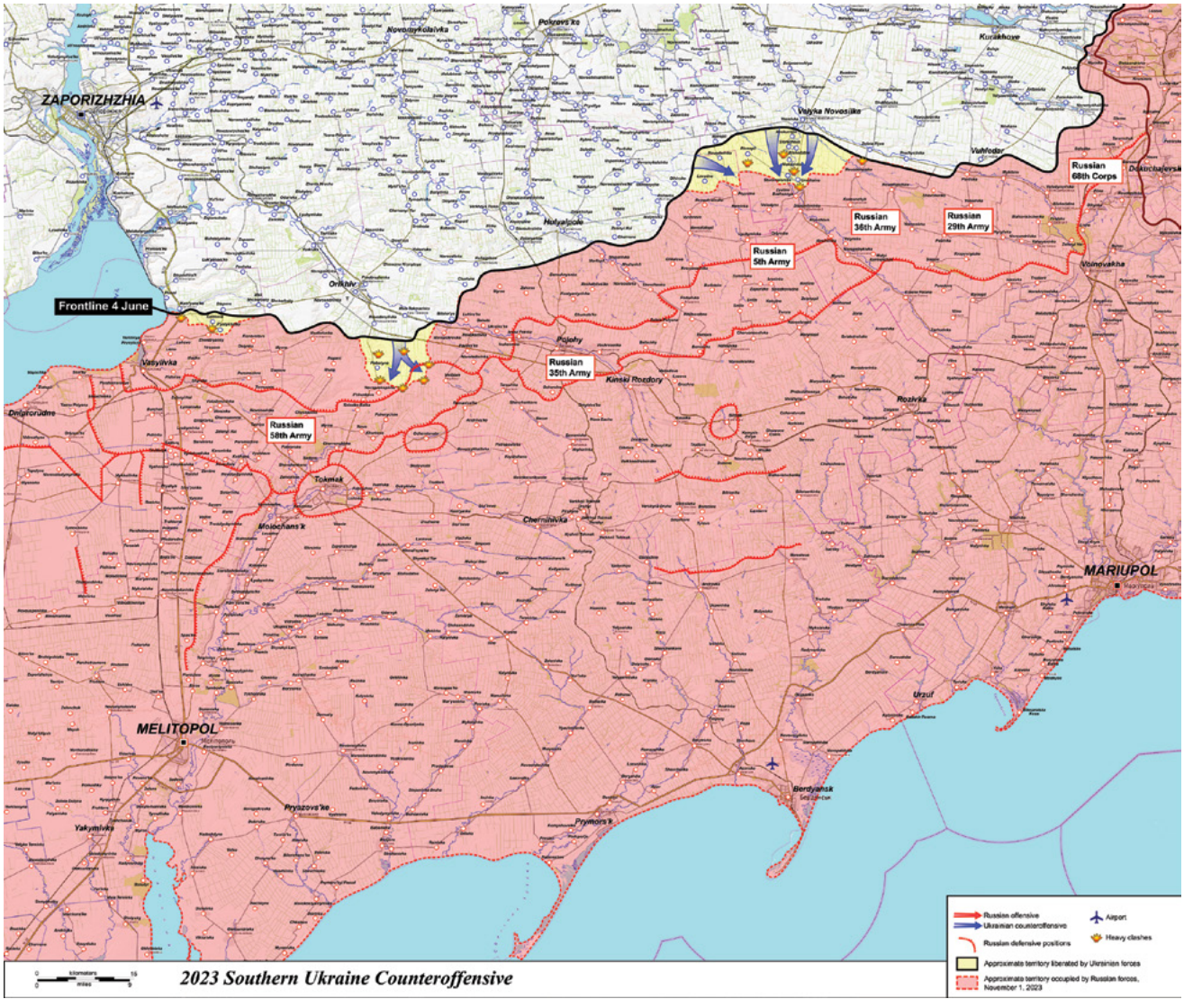
In a recent report, the Institute for the Study of War referred to the current tactical problem of forced dispersion and positional warfare as being the result of the so-called "Tactical Reconnaissance Strike Complex," a combination of tactical reconnaissance conducted primarily by drones but also radar and electronic warfare assets, with long-range strike systems such as artillery (with or without precision munitions) as well as first-person-view drones and loitering munitions.[32] In the Soviet and Russian military lexicon, this has been referred to as the "reconnaissance-fire (ROK) and reconnaissance-strike complexes (RUK)" at the tactical and operational levels, respectively.[33] More commonly referred to as a sensor-to-shooter cycle, the main differences from traditional artillery are the depth to which one can adjust fires, extending far behind the enemy front line; increased precision; and especially the speed that can be achieved from target detection to subsequent destruction. Though much more complex and dynamic, the current challenge in order to restore maneuver basically remains the same as it was during World War I: reestablishing conditions that enable a concentration of forces by disrupting the defenders' ability to effect and disrupt the breach or crossing as well as isolating the attackers' breakthrough sector from enemy reinforcements through effective battlefield air interdiction.[34] If this is not possible, one alternative is to establish combined arms formations at the lowest tactical levels by providing the necessary means to enable dispersed tactical units to operate independently.[35]

The 2023 Ukrainian Counteroffensive

The Russian defenses in Zaporizhzhia Oblast in 2023 were among the strongest along the entire front line and were subdivided into three different layers, each consisting of multiple obstacle barriers, including deep and dense minefields as well as trench systems, stretching out to almost twenty miles in depth.[36] Much like its Soviet predecessor, however, Russian defenses consisted not of the uninterrupted trench lines reminiscent of World War I but rather of dispersed clusters of strongpoints manned by individual companies and platoons with overlapping fields of fire and large amounts of antitank guided missiles. These positions were backed by artillery firing from dispersed positions further behind and tanks operating in small groups to support local counterattacks, as well as large amounts of drones in both reconnaissance and attack roles.[37] The Russian troops manning these defenses primarily belonged to the 42nd Motor Rifle Division and 7th Airborne Division (VDV), both under the command of 58th Combined Arms Army. Six regiments in total, augmented by naval infantry and two other divisions (19th and 76th) held back in reserve. Together, these units could muster up to a thousand artillery pieces, including multiple launch rocket systems (MLRS) and almost two thousand tanks and armored fighting vehicles. Ammunition supplies for artillery on site were enough to last over a month of high-intensity combat.[38]

Following repeated war games, the Ukrainians selected the Orikhiv-Tokmak axis as the main effort, with a total frontage of about twenty miles wide and with the ultimate aim of capturing Melitopol in order to sever Russian lines of operation along the Black Sea coast. Secondary attacks were conducted at Bakhmut and in the direction of Berdyansk in order to tie down Russian reserves. To accomplish this task, the Ukrainian army gathered at least nine brigades along the main effort, most of them newly raised, and divided them into three separate echelons.[39] Ninth Corps, making up the first echelon consisting of 33rd, 47th, and 65th Mechanized Brigades (making it equivalent to a division in strength), was to breach the Russian front line and was therefore assigned most of the new Western equipment. Tenth Corps, forming the second echelon and outfitted mostly with older Soviet equipment, would then continue the attack toward Tokmak. The third echelon, the so-called "Maroon" Corps, included the more elite 46th Airmobile and 82nd Air Assault Brigades and would exploit the attack toward Melitopol. This was deemed sufficient to overcome the initial six Russian regiments, as long as the necessary tempo was maintained, and prevent the arrival of reinforcements. The initial assault was to be preceded by preparatory artillery fire, while in the weeks leading up to the offensive, a shaping operation was conducted using guided MLRS (GMLRS) and Storm Shadow or Scalp cruise missiles against Russian command-and-control and logistical nodes. Meanwhile, preliminary operations around Bakhmut began in mid-May in order to tie down Russian forces.[40]

The main artillery preparation began during the early morning hours of 4 June. The ensuing ground



(Map by Rr016 via Wikimedia Commons)

2023 Southern Ukraine Counteroffensive During the Russo-Ukrainian War

assault, however, was delayed for several hours because of inadequate deconfliction measures during the forward passage of lines, leading to several friendly fire incidents. The actual ground assault, therefore, was not conducted immediately following the artillery bombardment. Consequently, Russian troops manning their defenses were not suppressed while the lead Ukrainian units began their advance.[41]

The next problem arose when the advancing mechanized companies, supported by small numbers of tanks, tried to break through the exceptionally deep Russian minefields. While trying to work their way forward, Ukrainian mine-clearing vehicles became easily targeted by Russian antitank guided missiles. The tanks and infantry fighting vehicles following behind soon became immobilized by mines while trying to get out of the vulnerable corridors. These were then effectively targeted by Russian artillery and first-person-view drones. Those who were able to escape from this carnage were subsequently picked off by Ka-52 attack helicopters and Lancet loitering munitions operating from longer ranges. During the opening days of the offensive, multiple Ukrainian mechanized companies suffered this fate and were virtually annihilated.[42]

As U.S. military officials began pressing the need to concentrate forces at the decisive point, Gen. Valerii

Zaluzhnyi, the Ukrainian commander in chief at the time, instead decided the opposite.[43] After four days of concentrated mechanized assault ending in failure, during which the Ukrainians lost over half of their mine-clearing equipment, they reverted back to employing small-scale dismounted infantry assault tactics supported by small numbers of tanks and infantry fighting vehicles.[44] Although this limited Ukrainian losses, it sacrificed tempo, and as a result, the Russians were able to bring in significant additional reinforcements. As the offensive grinded down into an attritional phase, the counterbattery battle intensified.[45] While a significant amount of Russian artillery systems ended up being destroyed, it was not enough to mitigate Russian dominance in fires. The initial commitment of 10th Corps, followed by the Maroon Corps in July, to reinforce or rotate frontline formations made a successful breakthrough and subsequent exploitation even more unlikely, despite the attack frontage being narrowed from twenty to just over six miles. Nevertheless, the advance continued slowly but steadily throughout August. The Ukrainian 47th brigade eventually managed to capture the village of Robotyne on 28 August, eighty-five days after the start of the attack and a mere fourteen kilometers from the initial line of departure, which had been an objective for the first twenty-four hours. By mid-September, however, it became clear that the offensive had finally culminated.[46] There are a number of important and perhaps obvious reasons why the Ukrainian counteroffensive failed:

- the choice of the general staff to commit newly raised brigades along the Ukrainian main effort instead of more experienced troops;
- the general lack of training on new Western equipment;
- a shortage of specialized mine-clearing vehicles;
- the fact that each brigade possessed only two to three companies capable of offensive action, which necessitated their relief by regular infantry every time they captured a Russian position and thereby reducing the overall tempo;
- their inability to conduct operations at scale because of battalion and brigade staffs being undertrained; and
- the fact that the Russians possessed detailed information about the Ukrainian operational plans, to name but a few.[47]

These reasons, however, merely illustrate that the Ukrainians could not solve the primary tactical dilemma both sides had and still have to face, which, as Zaluzhnyi himself stated afterward, is that "modern sensors can identify any concentration of forces, and modern precision weapons can destroy it."[48] Furthermore, he argued, "The success of the troops operations directly depends on the effectiveness of strikes and fire, so the hunt for the enemy's fire is a priority for both parties."[49] Zaluzhnyi clearly stressed the importance of the counterbattery battle to be won as a prerequisite for maneuver, which nowadays encompasses much more than just the artillery, but if successful it can reestablish conditions that enable a (temporary) concentration of forces at the decisive point.

Furthermore, there are a number of clear indications why the Ukrainian army failed in doing so. For one, the density of artillery was not particularly high to begin with. The greatest number of 155 mm howitzers operating at one time in concert to support the offensive along the Orikhiv-Tokmak axis was fifty-five, firing a maximum of seventy rounds per gun per day, but usually much less. The availability of GMLRS was likewise severely limited.[50] Additionally, the deep strike campaign, prior to and during the offensive, was not sufficiently aligned with actual ground operations and the offensive's goals to be achieved, as it primarily targeting Russian logistical hubs and command-and-control facilities far behind the front as well as elements of the Russian Black Sea Fleet.[51] Later, while the offensive was ongoing, GMLRS strikes were reprioritized to target Russian artillery, but by then it was too late. Moreover, Russian countermeasures against Western precision weapons such as GMLRS and Excalibur were quite effective.[52] Besides the limited efficacy of Ukrainian ground-based fires, Ukrainian air assets were equally unable to conduct battlefield air interdiction because of strong Russian air defense capabilities. The distributed nature of Russian defenses made it difficult for Ukrainian artillery to mass its fires and destroy or suppress the Russian defenders.[53] Meanwhile, the Russian Tactical Reconnaissance Strike Complex, in contrast, enabled them to target massed Ukrainian armor effectively, in turn forcing them to disperse. What remained were individual tanks and armored vehicles that were easily picked off by individual standoff weapons.

Conclusion

The German army at Riga deployed three divisions on a front nearly six miles wide. In contrast, the Ukrainians in Zaporizhzhia attacked along a front three times as wide, with a force approximately only one-third of that size. In both cases, the attacking formations planned to advance in three successive echelons in order to sustain the attack and maintain tempo. Despite Ukraine's obvious low force-to-space ratio, the need for concentration of forces at the decisive point as a prerequisite for offensive action remains as relevant today as it was a century ago. The same is true for its vulnerability to increases in firepower. A defense in depth derives its strength from its ability to project and sustain defensive combat power from longer distances, creating a sequential and overlapping effect through a system of mutually supporting weapon systems, traditionally directed primarily against an opponent's front. Historically, due to limited ranges for observation and fires, the defense had to be equally dense to achieve the desired effects. Today, more than ever before, modern weapons enable a defender to concentrate effects from relatively large distances and dispersed positions against an attacker's front and far beyond.

A comparison between the two offensives therefore reveals the necessity to be able to temporarily shield the planned breakthrough sector from the enemy's (mostly indirect) effects and prevent it from being strengthened through reinforcements. This is what the *deep battle* was designed to accomplish, although during the First World War, this development still was in its infancy. It is also clear that under modern circumstances, this has become much more complex and difficult to achieve. It no longer means just silencing the enemy's artillery—which, operating from dispersed positions, is more difficult to locate and destroy by massed fires—and also blinding enemy sensors and different attack forms including controlling, or at least affecting, the electromagnetic spectrum. Coordinating and synchronizing the necessary assets and their effects to register as cumulative effects requires centralization at higher levels. Suppose an attacker is unable to establish these conditions, however. The other logical option remaining is to disperse and to generate the necessary firepower not by massing forces but by delegating heavy weapons down to lower tactical levels, enabling smaller units of action to provide their own fire support. At Riga, the Germans applied both. The centralized and well-orchestrated preliminary artillery bombardment by Bruchmüller and the deployment of specialized assault detachments on a grand tactical scale proved to be the key ingredients for the stunning German success. In 2023, the Ukrainian army failed at the first and therefore switched to the latter out of necessity. For any breakthrough to be successful in the future, sensors and fires need to centrally coordinated to achieve the preconditions that enable the commitment of a concentrated force. ■

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