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The More Things Change ... Russia's War in Ukraine Mirrors the Past as Much as It Shows the Future

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This article discusses observations and implications of Russia's invasion of Ukraine. Though foolhardy to call them "lessons learned," the most intense fighting in Europe since World War II provides insights that should inform defense doctrine, equipping, and training. First, warfare remains an expensive, consumptive affair in which armies expend vast amounts of equipment, ammunition, and supplies. Because modern weapons require high-tech manufacturing, they take more time than previous equipment; producing them at scale is difficult, and stockpiles are critical as are the capabilities required to deploy them. Second, well-trained forces remain more important than technological or materiel asymmetries. Willpower matters.¹ Russia's initial invasion, which seemed predicated on using mass to overcome training and logistics deficiencies, failed against an effective Ukrainian military and civilian resistance built partly by NATO assistance and training since 2014. Compounding issues in Russian training and force structure was a deficient readiness reporting system corrupted by incompetence, nepotism, and fear. Third, the proliferation of secure, distributed, and redundant communication systems has amplified the power of information collection while allowing forces to remain disbursed and flexible (if employed correctly). Modern communication networks have, in a trend dating to World War I, increased the penalty for mistakes. Modern battlefields dull offensive maneuver unless adequately supported by deception operations. The proliferation of sensors, unmanned aircraft systems, man-portable missiles, and long-range fires have made battlefields increasingly lethal to mechanized, hard-to-hide vehicles.²

After exploring these observations, this article offers recommendations including strengthening strategic stockpiles and the industrial base to enable replacement of wartime losses. Military forces must adjust training to presume observation; this necessitates distributed operations and, potentially, contested deployments even from another continent. Importantly, the Ukraine war demonstrates that—regardless of technological development—competency comes from *better training* not equipment. Last, reporting systems must accurately assess unit training rather than simply measuring task iterations and equipment on hand.

The Consumptive Nature of Warfare

Russian losses in the initial invasion were enormous, especially considering Ukrainian forces lacked offensive airpower, significant tactical air and helicopter forces, and armored parity in February 2022. By employing effective defenses and communications—more on that later—and utilizing mobile teams and static defenses equipped with antiarmor missiles supplied by the United States and NATO, the Ukrainians devastated Russian armored and mechanized forces. In May fighting around Kharkiv, Russia's First Guards Tank Army lost over 130 tanks.³ That is approximately as many tanks as an armored brigade combat team, of which the U.S. Army has only eleven. Pentagon estimates of Russian casualties exceed one hundred thousand though Moscow has

acknowledged only six thousand killed.⁴ As of early 2023, Russian forces have lost (destroyed, damaged, lost, or abandoned) at least the following:

- ~3,200 tanks (including 2,260 T-72s, 580 T-80s, 417 T-90s, and other vehicles)
- ~2,750 mechanized fighting vehicles (BRM/BMP equivalents)
- ~501 self-propelled artillery or rocket launcher vehicles
- ~161 towed artillery pieces
- ~69 aircraft (66 fighter/attack aircraft, 2 bombers, and 1 transport aircraft)
- ~75 helicopters (53 attack helicopters, 16 transport/utility helicopters)
- ~3,000 miscellaneous support vehicles⁵

According to estimates from the International

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The long-term storage section of Sierra Army Depot, California. Hundreds of M113 variants seem to stretch to the horizon. In the foreground are M60 main battle tanks. Depot stockpiles are crucial for maintaining a fighting force during large-scale combat operations. (Photo courtesy of the U.S. Army)

Institute of Strategic Studies, these losses total most of Russia's active tanks and 30 percent of its stockpiles, most of which are older T-55 models fifty to seventy years old.⁶ Other losses comprise one third of Russia's armored personnel carriers, 5–10 percent of its artillery pieces, 15 percent of its attack aircraft, and 13 percent of it is attack helicopters.⁷

The most interesting takeaway is the expenditure rate of munitions, specifically artillery, and surface-to-surface and antitank missiles. Though late 2022, Ukrainian forces fired on average 4,000–7,000 artillery rounds *per day* throughout the conflict.⁸ Russian rates varied from double to quadruple Ukraine's.⁹ While Ukrainian fires dropped in early 2023 due to shortages from Western suppliers and stockpiling for Ukraine's summer 2023 offensive, these rates exceed anything since World War II.

Simplifying this analysis to only 155 mm rounds means the 2022 daily average artillery fire rate of 30,000 rounds is almost ten times current U.S. *monthly* 155 mm production (3,250 per month) or just less than a year. The United States has already provided Ukraine over 800,000 rounds of 155 mm ammunition while Ukraine is asking for 250,000 *per month*.¹⁰ Though the Pentagon believes it can expand 155 mm manufacturing, the war has nevertheless consumed at least *six years* of 155 mm production.¹¹

The situation for specialized munitions like the GPS-guided 155 mm "Excalibur" rounds is more dire; the United States sent Ukraine nearly *fifteen years'*

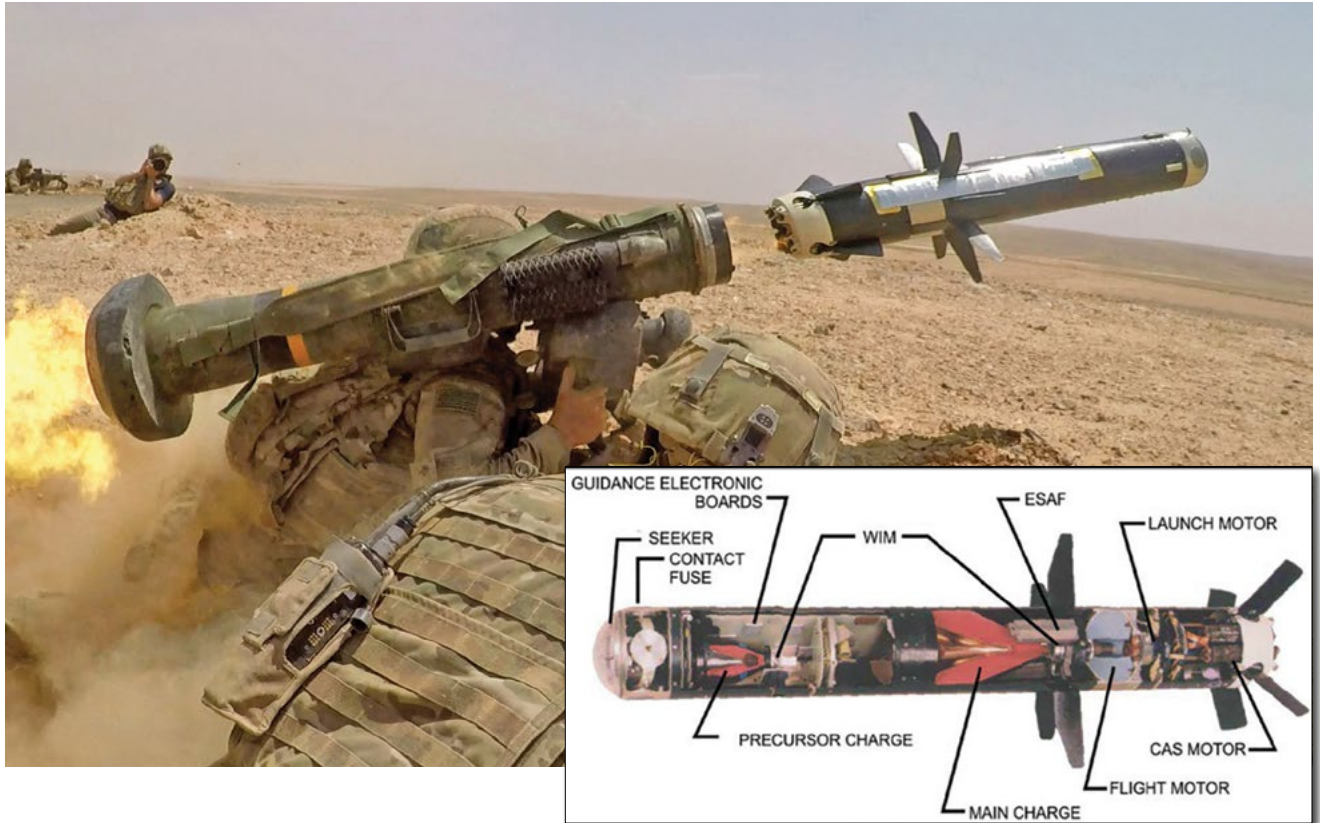


"Saint Javelin of Ukraine," a common meme from early in the Russia-Ukraine war. (Photo courtesy of Wikimedia Commons)

worth of Excalibur production.¹² The 8,500 Javelins provided represent five to eight *years* of production.¹³ The 1,600 Stinger antiaircraft missiles are nearly *twenty years* of production.¹⁴

Javelins helped blunt Russian armored columns by allowing mobile bands of Ukrainian soldiers to destroy Russian tanks and mechanized vehicles without armored support. The Javelin is an engineering marvel, able to attack targets up to 2,500 meters away by climbing to five hundred feet to strike tanks on their vulnerable topside.¹⁵ Operators utilize a compact, powerful day/night sight to locate a target, which is then passed to the missile. The thermal seeker which can see through darkness, obscurants, and concealment such as trees and netting. The missile contains another seeker and a two-stage shaped charge warhead that can defeat most armored vehicles. Operating the sight and missile requires another marvel: a small compact battery powering electronics and a cooling system. The Javelin is a "fire and forget" weapon. Soldiers can launch a missile in a few minutes before moving to a safe location or attacking another vehicle.

The Javelin is emblematic of modern warfare's expensive consumption. Using Javelins is simple but *producing* them is not. Javelins contain multiple highly specialized components and require highly skilled workers. Basic high-explosive artillery rounds are



Infantry soldiers with 1st Battalion, 8th Infantry Regiment, 3rd Armored Brigade Combat Team, 4th Infantry Division, fire an FGM-148 Javelin during a combined arms live-fire exercise 27 August 2019 in Jordan in support of Operation Eager Lion. (Photo by Sgt. Liane Hatch, U.S. Army) Javelin missile diagram (inset) from the Program Executive Office Missiles and Space Weapons Systems. (Graphic courtesy of the U.S. Army)

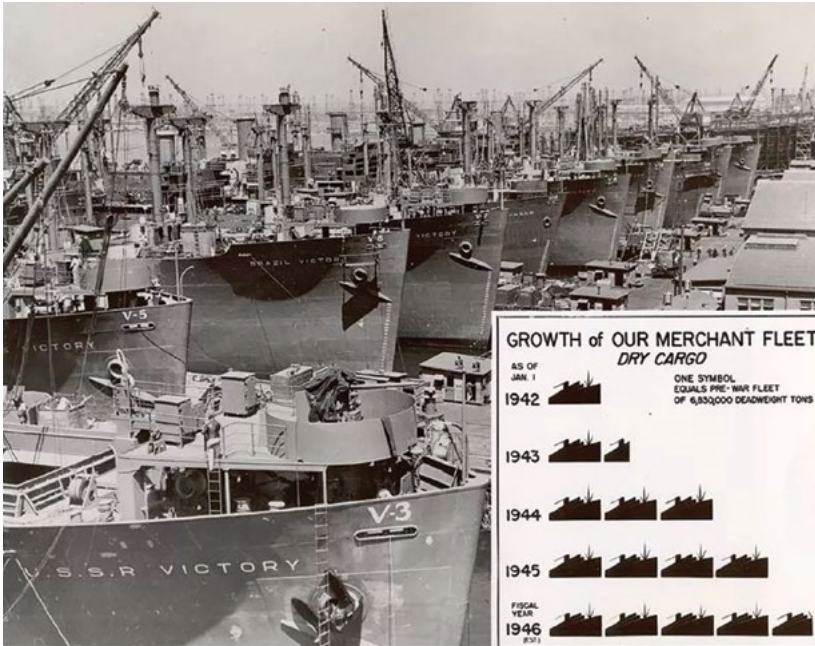
relatively simple to produce and scale rapidly if needed. But aircraft, missiles, and ground combat vehicles have robust production requirements. And many American systems like the A-10 attack airplane, F-22 fighter, and Stinger anti-aircraft missile were last purchased in the 2000s. The Navy's primary tactical fighter, the F/A-18, will end production in 2025.¹⁶

The rapid increases in production the United States saw during World War II are no longer possible. Navy shipyards have seen a precipitous decline of nearly 60 percent since the Cold War.¹⁷ By the end of World War II, U.S. shipyards produced "Liberty Ships," small 14,000-ton cargo ships used to move troops, equipment, and supplies, in just thirty-nine days on average.¹⁸ U.S. shipyards built 2,700 of these ships in just four years. Conversely, the USS *Gerald R. Ford*, the U.S. Navy's latest aircraft carrier, just embarked on its first operational deployment, thirteen years after construction began.

Even if funded, the erosion of manufacturing in the West along with a decrease in mechanical skills means

training and retooling times have increased.¹⁹ According to the nonprofit Manufacturing Institute, there "were 826,000 manufacturing jobs open as of [June 2023]" with another 2.1 million job openings projected by 2030.²⁰ For defense manufacturers, the issue is finding skilled workers. Increasing production is not a matter of simply applying resources but rather engaging a vast global supply chain which may be imperiled by the very conflict at hand. Additionally, modern electronics rely on rare earth materials like germanium (thermal sights), palladium (electronics), neodymium (magnets), and others which are in high demand and under strict import/export controls even during peacetime. Many of these materials are already subject to export controls. As COVID-19 demonstrated, supply chain interruptions can have long-lasting downstream effects that take months or years to untangle.

U.S. forces have exhausted ordnance before. During the campaign against ISIS, American and allied aircraft used over twenty thousand bombs and missiles throughout 2015, necessitating usage



Liberty ships moored at a pier, 1945. U.S. shipyards built 2,700 of these ships in just four years to move troops, equipment, and supplies. (Photo courtesy of the U.S. Maritime Administration)

restrictions as stockpiles ran low.²¹ Then Air Force Secretary Deborah James remarked: “Weapons take years to produce from the day the contract is assigned until they roll off the production line.”²² As Ukraine and Russia have demonstrated, modern warfare against an organized enemy will likely involve many more targets and massive consumption of munitions. ISIS did not have mechanized formations.

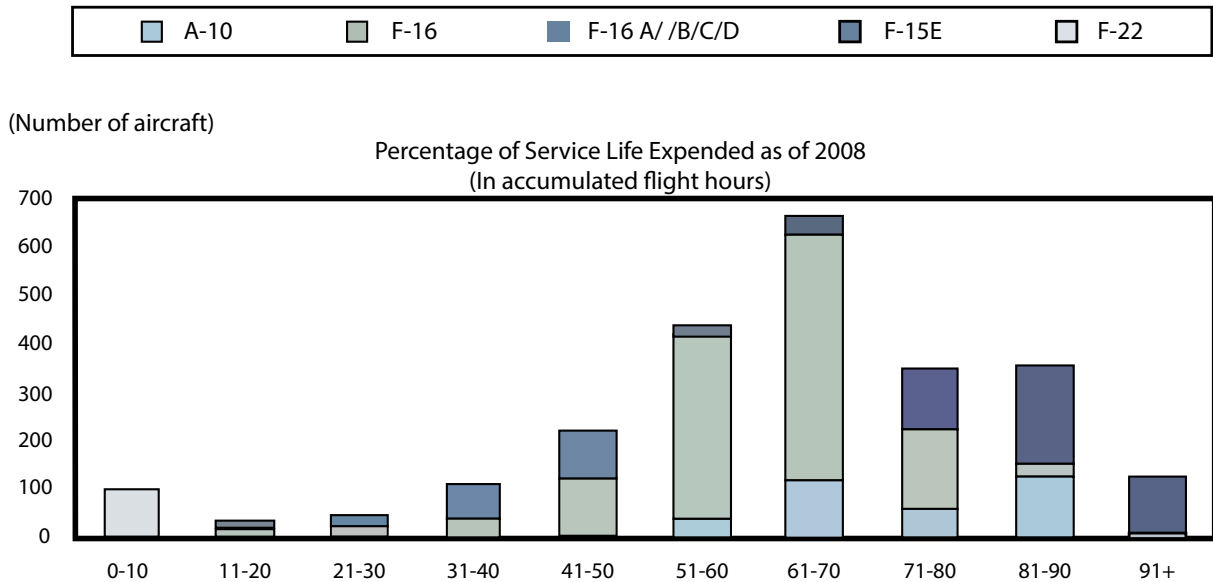
Likewise, several military aircraft models experienced overuse during operations in Iraq and Afghanistan. The wisdom of using high-tech fourth- and fifth-generation jet aircraft for loitering close air support missions is beyond the scope of this article. But because the services never developed a light jet or turboprop aircraft to fulfill this role, Air Force F-16s and F-15s and, to a somewhat lesser extent, Navy F-18s, expended significant portions of their lifetime hours, greatly reducing their life expectancy. For example, by 2008, after just five years of operations in Iraq and Afghanistan, more than 70 percent of U.S. Air Force fighter aircraft had expended half of their lifetime hours. By 2009, the Congressional Budget Office projected a shortage of seven hundred Air Force fighters (see figure, page 6).²³ These consumption rates imply that modern warfare has more in common with late World War I battlefields than the

six-week U.S.-led campaign that toppled Saddam Hussein’s Iraqi government. Like World War I, Ukrainian and Russian strategic reserves and production centers are largely outside the scope of the conflict. NATO support from Western Europe and North America has provided Ukraine strategic sanctuary. Russia, owing to its vast size and Belarusian ally, has similar sanctuaries. As in the First World War, untouched strategic support areas likely prolonged the conflict because both sides can acquire, mobilize, and deploy resources from uncontested spaces. And as a century ago, distribution networks could rapidly deploy equipment from support areas to the fighting, though global airlift has accelerated this process from weeks to days.

The precious nature of modern munitions and systems creates two challenges. The first is what analyst Evan Montgomery calls “commitment crossfire.” Because “military personnel and platforms cannot be present in multiple locations at the same time,” losses incurred in one area can significantly limit capabilities deployed elsewhere.²⁴ Because the same limited number of capabilities—such as Patriot and THAAD missile systems, F-35 fighter aircraft, aerial refueling aircraft, and X-band radar—may be required in different areas of the global simultaneously, “one contingency can limit the forces” available globally.²⁵ This can make for difficult decisions and stark tradeoffs.

Second, because the United States fights “away games” far from its shores, power projection capabilities are absolutely essential along with pre-positioned stocks.²⁶ Power projection is typically associated with cargo aircraft such as the C-17 and C-5 but also includes a host of capabilities across multiple domains including rail transportation systems and ships with “roll-on/roll-off” ramps that can handle tracked vehicles. Also, important is aerial refueling to extend the operational reach of aircraft.

Fortunately, the U.S. military has spent two generations deploying and sustaining forces to remote locations such as Afghanistan. That the United States Air



(Figure from the Congressional Budget Office, *Alternatives for Modernizing the U.S. Fighter Forces* [May 2009])

Figure. Air Force Fighters Service Life Expended

Force was able to evacuate approximately one hundred thousand people from Kabul Airport in two weeks is a testament to America’s strategic airlift fleet.²⁷ But the evacuation aside, the logistical burden of forces in Iraq and Afghanistan was largely borne by local contractors. Moreover, the airspace in Iraq and Afghanistan was also entirely uncontested. That may not be the case in future conflicts. Even air and sea routes far from the battlefield may be contested. The scope and scale of a modern conflict would exhaust available airlift; a single containership can carry more military cargo and vehicles than the entire Air Force.²⁸ And with both the C-17 and C-5 no longer in production, losses cannot be replaced. The Air Force has fifty-two C-5s and just over two hundred C-17s.

Sealift is essential to move forces far, but it takes time and requires ready ships. The buildup for Desert Storm, which involved approximately five hundred thousand American troops and fifteen thousand vehicles from Europe and the continental United States, took over four months.²⁹ The Desert Storm buildup occurred close to the eventual fighting and was entirely uncontested. Desert Storm demonstrated American capabilities under near-perfect conditions: nearby allied and partner support, a willing host nation, uncontested deployment, and an incompetent adversary in

the form of Saddam Hussein. Future forces may not be so lucky.

Moreover, the United States’ strategic sealift fleet decayed in the decades since. The Pentagon has just fifteen rapid, roll-on/roll-off ships of a total fleet of sixty-one ships. The sixty-one ships controlled by Military Sealift Command average forty-seven years old and over 20 percent are not mission capable.³⁰ According to a 2020 Center for Strategic and Budgetary Assessments report, “If a large-scale troop build-up were needed to occur quickly overseas, the U.S. strategic sealift capability would be unlikely to meet the Pentagon’s dry cargo, munitions or tanking needs.”³¹

To alleviate the burden of deploying from the American homeland, the U.S. Army has set up pre-positioned stocks in strategic locations. Designed to equip a brigade’s worth of soldiers with tanks, howitzers, and other vehicles, Army stocks provide a valuable capability for rapidly building combat power. But the stocks are other worthwhile if maintained. A recent Department of Defense Inspector General report revealed deficiencies in equipment from Army stocks in Kuwait shipped to Ukraine. According to one inspector, the M777 Howitzers were so badly managed that firing them without significant fixes “could be fatal to the crew operating the howitzer.”³² Getting the stockpiles



Fourteen KC-135 Stratotankers line up during a simulated alert call 24 March 2016 at McConnell Air Force Base, Kansas. The “elephant walk” was part of an exercise that displayed the rapid mobility capabilities and teamwork of the men and women at McConnell to take flight within minutes of being notified of a mission. (Photo by Airman 1st Class Christopher Thornbury, U.S. Air Force)

HMMWVs ready to go required over \$120,000 worth of tires.

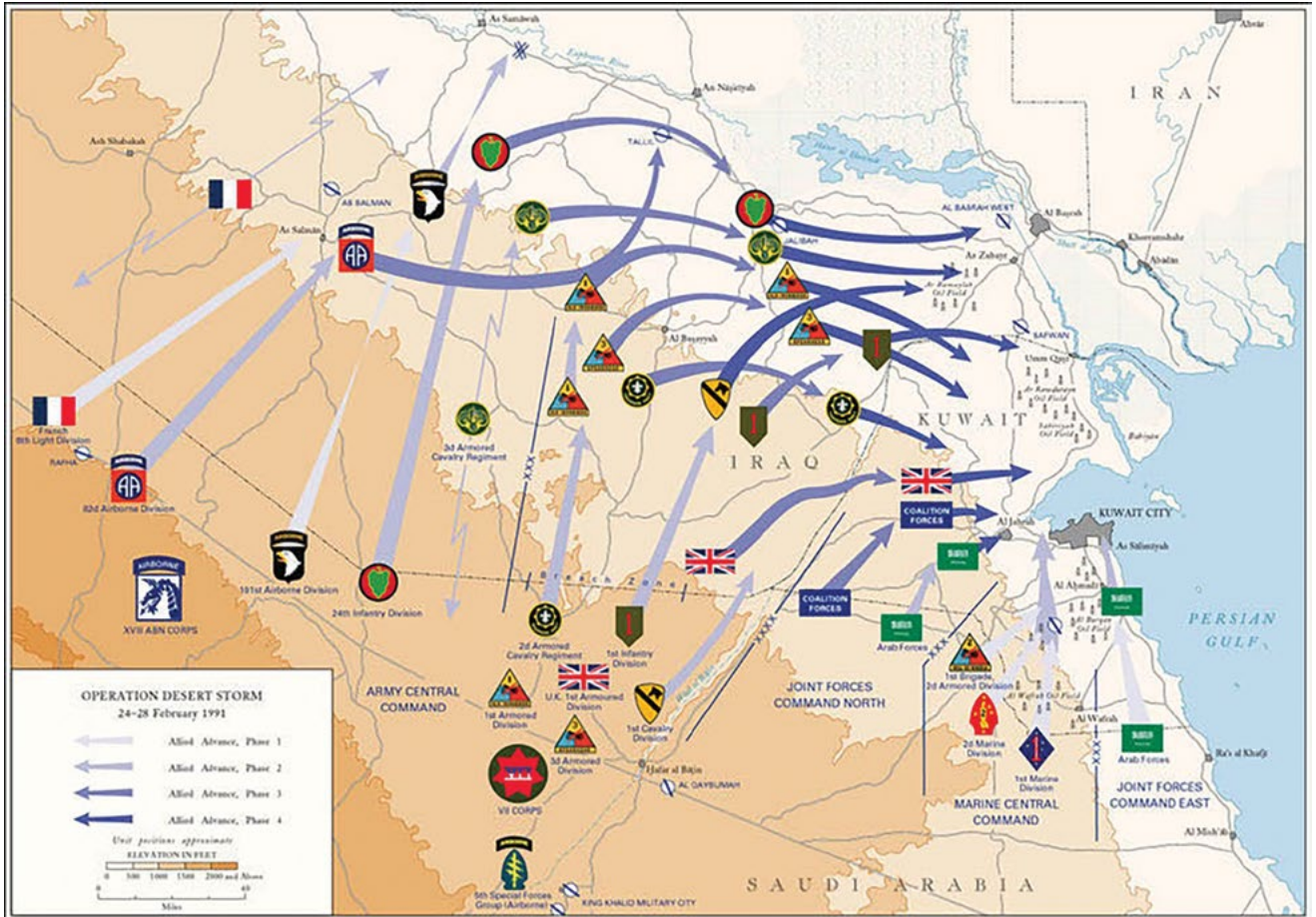
Well-Trained Forces Remain the Best Predictor of Success

The Ukraine war demonstrates the primacy of competence over technology. Technology has aided Ukrainian success but served only to *exacerbate* differences in competence rather than create them. As two analysts at the Modern War Institute put it: “Numbers of tanks matter, but the tanks’ specific capabilities matter even more, and method of employment more yet.”³³ Technological progress and the prevalence of communication tools on the battlefield affects warfare but have not fundamentally changed it. The impact of technology has been evolutionary rather than revolutionary.³⁴

Analysis of the Gulf War reflects this. The proximate cause of American victory was not the range, firepower, speed, or night vision capability of American equipment but how forces fought as a combined arms team. A “synergistic interaction between a major skill imbalance and new technology” produced lopsided outcomes.³⁵ In other words, technology increased the American kill ratio, but it did not foretell the outcome.

Training makes the difference. Even a simple company-level tank attack requires orchestrating maneuver, fires, logistics, and intelligence across time, distance, and multiple domains. Leaders must be “Musicians of Mars in Multiple Domains,” according to the commander of the Army Combined Arms Center, Lt. Gen. Milford Beagle.³⁶ But combined arms synergy does not come about due to funding or technology. Employing combined arms requires training across multiple echelons and a long-term investment in military culture.³⁷ Importantly, executing effectively across echelons requires expertise and experience at each echelon; in practice this means trusting and employing non-commissioned officers (NCOs). Ukrainian leaders have said as much, attributing their “unpredictability” and tactical success to NCOs, which was revamped following the 2014 Russian seizure of Crimea.³⁸ Since 2014 \$2 billion worth of NATO support and training rebuilt Ukraine’s military into an effective force.³⁹

Conversely, Russia’s inability to rapidly seize Kyiv and its poor use of airpower against the smaller Ukrainian military revealed a hollow, incompetent force that suffered four thousand casualties in the war’s first weeks.⁴⁰ In the air, Russia was unable to coordinate its vastly larger air force against initially sparse



The Third U.S. Army threatened to completely close off northern escape routes, forcing Iraqi forces to surrender 10 January 2007. (Map courtesy of the 40th Public Affairs Detachment)

opposition and limited air defense.⁴¹ The wholesale ineptitude of the Russian military surprised many analysts.⁴² For Russia, which falls somewhere between autocracy and kleptocracy, improving this force may prove culturally impossible. As one analyst put it, “many of Russia’s failures will require years of changes and will force the Russian military to rethink its training, organizational structure, culture, and planning to improve readiness and military performance.”⁴³

The fighting in Ukraine exhibits continuities with the “modern system” that emerged at the end of World War I. This system consists of distributed organizations trained to employ fire and maneuver to secure positions of relative advantage.⁴⁴ The modern system requires integration fire and maneuver to achieve localized superiority, which can manifest in breakthroughs. The constant observation seen in Ukraine makes this more difficult. Movements such as the famed “left hook” of Desert Storm (see map)—where twenty-five

thousand allied troops and thousands of vehicles shifted west 50–150 km over several days in the face of the Iraqis—now seem unrealistic or haphazard (certainly in an open desert).

The Ukraine late-summer offensives demonstrated this phenomenon. At no point did Ukrainian forces break through Russian lines at scale. The adroit deployment of forces along the front coupled with effective deception to create local imbalances. When Ukrainian forces attacked utilizing fires and maneuver, the Russians were caught off balance but not necessarily by surprise, allowing for a rapid Ukrainian advance.⁴⁵

Warfare is and will remain a profoundly human endeavor. Warfare requires fighting regardless of technology, quality or quantity of weapons, or the communications systems. As T. R. Fehrenbach remarked, “You may fly over a land forever; you may bomb it, atomize it, pulverize it and wipe it clean of life—but if you desire to defend it, protect it and keep it for

civilization, you must do this on the ground, the way the Roman legions did, by putting your young men in the mud.”⁴⁶ Notably, Fehrenbach wrote these words about the Korean War, which he originally subtitled “A Study in Unpreparedness,” regarding American forces at the war’s outset. In his view, American success in World War II and the development of the atomic bomb had created a version of technological complacency. Korea, to Fehrenbach, was a reminder of the physicality of war. Invoking Korea, S. L. A. Marshall remarked that soldier quality often mattered the most. Putting untrained troops against a disciplined enemy was using “boy scouts to fight Davy Crockett.”⁴⁷

Distributed, Redundant, Secure, Instant Communications

The modern fight is information systems.

—Rep. Adam Smith⁴⁸

Distributed, resilient communications further emphasize that massing personnel and equipment inevitably leads to targeting and likely artillery fire. While this has been true for a century, the rapidity of targeting and the lethality of fires has increased. With sensors and scouts distributed across the battlefield and equipped with cameras (cell phone or otherwise) linked to other units and headquarters using secure apps like Signal, WhatsApp, and other programs, battlefield intelligence is instantaneously converted to targets. Aided by Russian indiscipline, Ukrainian HIMARs, field artillery, and other systems have decimated Russian formations.⁴⁹

The Ukrainians have been particularly effective at targeting Russian command posts. According to military strategist James Greer, the Ukrainian tactic consists of four steps: (1) locate, (2) precision strike, (3) conventional strike, and (4) area bombardment.⁵⁰ Ukrainian drones locate command posts using a combination of general reconnaissance, signals intelligence, or tracking of Russian vehicles. Once the drone locates the main tent or building, the Ukrainians strike this location with precision munitions, either GPS-guided artillery, missiles, or U.S.-supplied HIMARs. Thereafter, Ukrainian artillery conducts an area bombardment. Typically, in less than twenty minutes, Ukrainian artillery or missile batteries then displace to a covered “hide site” or another location entirely.

None of this is new. Targeting command posts and/or leaders has always been an effective tactic. What is new is the ability to locate enemy command posts using cheap drones and commercially available sources such as satellite imagery coupled with increasingly able signal collection tools. Redundant, distributed communication networks using cell phones also allow for widespread, coordinated fires. According to Greer, “Any peer or medium-capability nation or non-state actor has the ability to locate, target and destroy US Army [command posts] with readily available and inexpensive resources.”⁵¹ Likewise, the ability to determine losses can be immediate and accompanied by literal photo evidence is significant. Whereas intelligence services once relied on indirect methods such as statistical serial number analysis to determine enemy losses versus production quantities, soldiers and satellites now quickly count the damage.⁵²

But Ukrainian forces are doing more than just effective targeting. The war also gives insights into the effects of the global social media environment.⁵³ There is an emergent soldier–shooter–texter model whereby individual soldiers both fight and enable intelligence and fires directly. Undoubtedly, the slowness of the Russian advance owes much to stiff Ukrainian resistance, the extensive time Russian units spent deployed before the February 2022 invasion, and Russia’s reliance on conscripts. Nevertheless, devastated Russian helicopters and armor columns were then highlighted by effective Ukrainian social media feeds. Memes, photos, and videos of Russian losses and/or Ukrainian successes often appear online within hours.⁵⁴ As one author commented, TikTok was made for modern war.⁵⁵

The frictions seen in Ukraine are endemic to the modern battlefield. The distributed intelligence and coordination networks made possible by mobile phones and social media have changed warfare, dulling the power of the offense. This is a result of evolutionary steps seen in the culminating campaigns of the First World War in 1918, the Allied advance across Northern Europe in 1944-45 and the 1973 Yom Kippur War. Technology enables defensive forces (when effectively employed as in Ukraine but not Iraq in 1991 or 2003, for example) to slow the velocity of attackers. Lethality increases the ability of defenders to attrit an offense. As Biddle concluded, “modern-system force employment shields both sides’ forces from the

increasingly lethality of more sophisticated weapons ... the net result of a much-slower attack and much-slower defensive response is a much longer campaign.”⁵⁶

The long-sought integrated, resilient, and immediate networks dreamt of by proponents of “information dominance” seems to be here—albeit not via the cumbersome and expensive military-specific networks imagined during the 1990s.⁵⁷ Instead, cellular, satellite, and fiber networks have proliferated, allowing widespread communication and observation, often secured via commercial encryption. Commanders can readily access information heretofore unimaginable, often augmented with corroborating pictures. But far from making victory easy, these technologies impede the offense. Russia’s strategic buildup near Ukraine’s borders was observed for months. The sheer volume of information transiting the modern battlefield and entering military command posts is often too much to address. It can result in paralysis.

As shown in the ultimately successful but costly Russian advances into Bakhmut and Mariupol, this new model favors the defense. Russian attackers faced all the difficulties of urban warfare seen since Stalingrad but abetted by satellite and drone surveillance and corresponding rapid fires. Likewise, anti-armor systems like the Javelin enable less well-trained soldiers to assume defensive responsibilities. Russian mass and determination prevailed, but the cost was enormous.

Survivability is increasingly difficult amid satellite (both military and civilian) observation and widespread communications networks. The proliferation of cheap firepower and redundant communication tools potentially dulls the operational offensive. Abundant battlefield sensors and commercial satellite imagery means mass and surprise may simply not be possible without communication blackouts or science-fiction-like stealth technology. A battlefield shorn of the fog of war presents severe penalties for mistakes. Combined with the inherent advantage of the defense, the offense may be sluggish for the foreseeable future.

Conclusion

Do these admittedly early observations mean the offense is dead? Probably not. Russian indiscipline and ineptitude have certainly contributed to tactical failures. Furthermore, the Ukrainian fall offensives demonstrate that maneuver by large formations can still surprise their enemy but not necessarily achieve

decisive victory. Nevertheless, the opportunity for large-scale maneuver may be waning in an era when every soldier is a sensor, shooter, and texter.

The implications of this new model of soldier communication on the organization, training, and equipping of militaries are profound. Disbursed, mobile, light formations below the battalion-level may be better suited to fight future conflicts, whether on the offense or defense—a recognition the U.S. Marine Corps has made.⁵⁸ But this insight runs counter to U.S. military doctrine, which favors the offense. The Army’s operational concept imagines armored thrusts as a cornerstone of achieving tactical success. But events in Ukraine have shown, massing large, heavy, logistics-dependent formations may not be possible, even with secure staging areas.⁵⁹

As important as recognizing the changes demonstrated Ukraine is acknowledging the continuities. Warfare remains consumptive and expensive, requiring enormous amounts of materiel. Quick victories remain elusive. Historians will inevitably parse the Russian decision-making and planning before the February 2022 invasion. Still, it seems evident that Russian planners did not anticipate the Ukrainian resistance and subsequent campaign. The Russian logistical system was unprepared for the scope or duration of the “special military operation.” When the initial invasion forces failed to secure their objectives near Kyiv, the result was a breakdown of the Russian forces and a massive traffic jam on the approaches to Kyiv. Competent, well-trained forces still matter even amid materiel asymmetries.

In *On War*, Prussian military strategist Carl von Clausewitz argued war tends to expand in new and complex ways beyond the ability of military or political leaders to foresee.⁶⁰ Leaders must, therefore, proceed cautiously into any military campaign doing their best to discern not only clear and attainable goals for military force but, importantly, *political* goals that force can make available. As important, policymakers must understand the uncontrollable nature of war and the specific conditions in which they seek to apply force. Failing to do so will lead to disaster. Clausewitz warns, “The first, the supreme, the most far-reaching act of judgment that the statesman and commander must make is to establish by that test the kind of war on which they are embarking; neither mistaking it for, nor trying to turn it into,

something that is alien to its nature.”⁶¹ Like much else in *On War*, this advice remains timeless.

Recommendations

1. Strategic stockpiles are critical. Modern men- tions and equipment are not simply produced, they must be on hand to be useful. This requires well-maintained stockpiles. Additionally, production lines must remain open. Ironically, over the past twenty years it has been Congress that forced the U.S. Army to maintain produc- tion of legacy systems such as the M-1 Abrams tank.

However, without replacement munitions or equip- ment in sufficient quantities, the Pentagon must keep production lines open (at least minimally) and stockpiles maintained. Doing so via munitions and equipment de- pots or increasing foreign sales is imperative. Munitions and equipment cannot be manufactured quickly enough to have battlefield effects. And, as discussed, even victory may cripple the military for years with- out sufficient stockpiles. A recent Center for Strategic and International Studies wargame regarding Taiwan reinforced this observation. Though most iterations of the wargame forecast an American and allied victory, the cost was enormous and would impact U.S. munitions and equipment production for over a decade.⁶²

2. Accounting for constant observation. The prevalence of battlefield sensors and communication networks mean militaries must account for constant observation. Furthermore, the lethality and preci- sion of fires have increased. No longer are precision strikes limited to special operations forces or higher levels of command. Rather, thanks to cell phones, any source can cue fires and backup requests with pictures. Continuous observation coupled with the proliferation of precision fires capabilities means units may be struck at any time. *That does not mean that making a radio or cell call will result in a strike.* However, units must train to operate in a distributed manner, only aggregating forces deliberately and when doing so will be used to achieve success or counterattack. Units should train to disaggregate capabilities unless they cannot do so effectively—helicopter maintenance or logistics hubs, for example, must be far to the rear.

3. Better training wins. Trained units expertly employing their equipment win battles. Materiel supe- riority, technological advantages, and even mass can be blunted by better employment and tactical skill. While

it develops modern equipment, the U.S. military must not ignore the reality that competency comes from *better training* rather than *better equipment*. Even amid wide- spread surveillance technologies, loitering munitions, and precision fires, armies still need capable forces able to maneuver to seize positions of advantage. As a recent article put it, “The question then becomes how best to organize, train, and equip mechanized forces to increase their survivability on the modern battlefield and adjust their role to support fires better, not whether mecha- nized maneuver forces are becoming obsolete.”⁶³

Tough training under conditions of uncertainty with- out communications (or specific guidance) is necessary. Doing simple things better as opposed to many things poorly should be the lodestone for training military units. Repetitive training on fundamental tasks such as gunnery, building defensive emplacements, and tactical- ly maneuvering between objectives builds competence more than a new piece of equipment or technology.

This requires both training and honest dialogue. Placing officers in ambiguous training scenarios will test their character and actions under pressure and foster a culture of operating in uncertain environments and lim- ited resources. However, commanders at all levels must foster discussions about the use of training time and be willing to accept “incomplete” marks on some tasks (nonessential training or otherwise). Doing what matters is most important. A recent article made this point suc- cinctly: “Kettlebells are useless on the moon.”⁶⁴

4. Readiness reporting matters, but it must be accurate. The U.S. military *does* have a robust readiness reporting system, but American military systems have often defaulted to measuring activity rather than pro- ficiency.⁶⁵ It is undoubtedly harder to do the latter. In Iraq and Afghanistan, units commonly reported dollars spent or the number of schools built, but such metrics did not necessarily translate to desired outcomes. This approach is analogous to measuring success by rounds fired rather than the precision of those fires.

A host of recent reports from the Government Accountability Office and the National Commission on Military Aviation Safety indicate issues with military aviation.⁶⁶ A series of aircraft accidents from 2013 to 2019 that cost 286 lives indicated that a lack of basic proficiency combined with distractions from nonflying duties was a proximate cause in many accidents. Even when pilots *did fly*, meeting minimum flight hours was

still associated with increased accidents.⁶⁷ The survey provided ample evidence that aviators who only flew minimums—and therefore technically “ready”—were less safe and made collective competence impossible. The National Commission on Military Aviation Safety linked aviation culture to risk; units that disregard a focus on aviation tasks will increase operational risk to aircrews.

The Government Accountability Office found similar issues with the Navy fleet, which is both overextended and overworked. According to one report, the “Navy routinely assigns fewer crewmembers to ships than its workload studies have determined are needed to safely operate them.”⁶⁸ Perhaps unsurprisingly only 17 percent of sailors got enough sleep when at sea.

By not accurately assessing its forces, the U.S. military risks giving policymakers unrealistic expectations

about both military capabilities and the cost to achieve them. Without appreciating the cost of manning and equipping the military, policymakers and Congress may see it as overfunded. While there is undoubtedly waste within the Pentagon budget, the military is largely overextended. It is the smallest it has been since before World War II, with a budget as a percentage of GDP akin to 1950. That was the year the aforementioned Korean War demonstrated the cost of an unready force. Accurate readiness reporting is critical to inform where shortfalls exist as well as the costs associated with maintaining capabilities. ■

The views and opinions expressed in this article are those of the author and do not necessarily reflect the view of the U.S. Army, the Department of Defense, or the U.S. government.

Notes

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