

On the Principles of War

Reorganizing Thought and Practice for Large-Scale Combat Operations

by Major Amos C. Fox, U.S. Army



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Contents

Preface	v
Introduction	1
Surveying the Evolution of the Principles of War.....	2
J.F.C. Fuller Lays the Foundations in the United Kingdom	2
Principle Development in the U.S. Army	4
Modern Development with Robert Leonhard.....	4
Revisiting the Principles of War.....	6
Principles of War.....	8
Transitioning the Principles of War into a Framework for LSCOs.....	13
Global Reach	13
Theater Reach.....	13
Battlefield Reach.....	15
Conclusion.....	16
Notes	17

Preface

The U.S. Army's conceptual innovation efforts tend to suffer from a layered problem. First, concept development efforts often fail to frame the problem that they are attempting to solve. Second, concept innovation suffers from coming to the discussion with answers to the problem instead of finding answers. Third, concept development and, by extension, doctrinal revisions suffer from recycling the same ideas, shuffling pre-existing paragraphs in a different order and packaging them as something new. Finally, concept and doctrinal development suffers from a dogmatic interpretation of many of the concepts found therein. This results in concepts and doctrine that are not nested but interbred and that do not account for war's true character. Today's frequency of urban sieges and proxy wars, all but unaccounted for in U.S. Army doctrine, affirms this assertion. That notwithstanding, the principles of war provide an excellent starting position for revamping U.S. military thinking; they also provide the broad framework on which to hang nascent concepts and doctrinal developments. This work conducts a survey of the history of the principles of war first by examining the work of theorists J.F.C. Fuller and Robert Leonhard; then it looks at the place of these principles in U.S. Army doctrine since their adoption in the early 20th century. From there, this work proposes a new series of principles of war, and accompanying assumptions, before closing with a general framework, built upon those principles and assumptions, for war in large-scale combat scenarios.

On the Principles of War: Reorganizing Thought and Practice for Large-Scale Combat Operations

Introduction

War today, and for the foreseeable future, is the competition among belligerent, robust and redundant systems. War is not fought against time, distance, speed, range or integrated anti-access/area denial (A2/AD) capabilities. Wars, especially against great-power competitors, are and will continue to be ponderous affairs that stretch over extended periods of time; they conclude only when an adversary is driven to strategic depletion or to a situation in which they are unwilling to continue withstanding the erosion of their resources and capabilities. As a result, wars are not fought and won quickly, nor are they fought or won at specific points. Battles and campaigns might quickly reach a conclusion, but the direct link between victory in an individual battle or campaign to strategic victory is dubious; such a connection is certainly not supported by an historical analysis of modern war. To be sure, the U.S and its allies quickly toppled the Taliban in the wake of 9/11, but they are arguably no closer to victory in Afghanistan today than they were at any previous point. Furthermore, the U.S. military and its allies' rapid dominance over Saddam Hussein's forces in Iraq in the spring of 2003 proved vacuous, as an amorphous, deadly and multifaceted insurgency flowed from that success.

A problem in existing and nascent literature about war is that it tends to focus on visions that deny or do not accept the realities of war, while continuing to advance disproven or unfounded assertions about the conduct of war. For instance, a recent U.S. Army publication, *Army Multi-Domain Transformation*, which is both tactically-minded and task-oriented, contributes to this problem.¹ It does so by not addressing war or the exercise of large-scale combat operations (LSCOs) in a broad framework against a great-power competitor. Rather, the paper provides solutions to discrete battlefield problems while completely missing the systems aspect of war—robust, redundant and networked structures striving to overcome the robust, redundant and networked structures of adversaries who are seeking both to avoid destruction and to obtain victory.

Furthermore, stale tropes continue to dominate “nascent” Western military thought and “new” U.S. Army concepts. *Army Multi-Domain Transformation's* reliance on extant jargon—positions

of relative advantage, the primacy of first battles, consolidation of gains, decisiveness and condition setting—is a tiresome collection of buzzwords that adds little to the ongoing dialogue of the conduct of war. Indeed, the reliance on words such as leverage, reputation, advantage and narrative, as well as tactical concepts like overmatch and dominance, leave much to be desired for armed forces that are focused on strategic victory.²

Defense analyst Michael Kofman, among others, recently argued that the dizzying array of disparate battle-fighting concepts, and their byzantine connection to the systems-dominated character of war, contributes to this problem.³ The way that concepts such as multi-domain operations (MDO), LSCOs and Project Convergence, to name a few, connect to the systems theory of war is not well supported; thus, it is out of step with the true practice of war.

A framework for war will help overcome this problem by providing purpose, structure and taxonomy to the discussions. The principles of war are the best place to begin this discussion because, if properly linked with the systems-dominated character of war, they provide a solid foundation for establishing a comprehensive conceptual framework for LSCO against great-power competitors. The principles of war, first developed by British theorist and general officer J.F.C. Fuller, are not divine verities above recourse; they are instead intended to be a responsive tool for the application of war. Therefore, it is important to briefly survey the iterations of the principles of war from inception to today before proposing an amended set of principles to guide the construction of a framework for war. The principles of war, old or new, cannot exist as stand-alone concepts. They must be rooted in assumptions about the current and future states of war.

Consequently, this work provides a set of seven assumptions that guide the development of nine revised principles of war. It then provides a basic framework for war built upon the assumptions and principles of war provided. The framework integrates systems thinking into the concept of war to provide a useful and holistic taxonomy for the theorizing and practice of war. In turn, this taxonomy provides a template upon which emerging battle and warfighting concepts can be hung, thereby unifying the principles and character of war with ongoing cognitive and material investment.

Surveying the Evolution of the Principles of War

J.F.C. Fuller Lays the Foundations in the United Kingdom

Theorist J.F.C. Fuller was one of the early intellectuals to develop a thoughtful and expansive taxonomy for the principles of war. His work, antecedent to today's principles of war and the U.S. joint force's Principles of Joint Operations, was developed through a comprehensive examination of the commensurate work of previous theorists and military leaders. Fuller, a company grade officer in the British Army's Oxfordshire and Buckinghamshire Light Infantry Regiment, established the principles as a result of developing training and doctrine for the British Army at the outset of World War I. His *Training Soldiers for War*, published in London in 1914, is the first instance in which he put pen to paper and enunciated his principles of war. He initially covered objective, mass, offensive, security, surprise and movement,⁴ stressing that the principles must be the underpinning foundation of any doctrine.⁵ Nevertheless, Fuller suggested that the principles themselves are an inanimate formula and must be synergized to obtain their true effect.⁶ For instance, he underscores that offensive without mass sets the course for a perilous misadventure, or that mass without movement invites disaster;⁷ the principles are not checklist-oriented items, but a comprehensive, responsive corpus that an actor must

Figure 1

Evolution of J.F.C. Fuller's Principles of War



implement as a collaborative package—using them individually or sequentially fritters away their effectiveness.

A few years later, Fuller updated his work. His award-winning essay, published by the United Kingdom's Royal United Services Institute (RUSI) in May 1920, expanded his previous six principles to eight, adding concentration and economy of force. He also expanded on the principles' position within war's theoretical foundation. In effect, Fuller viewed the principles as a heuristic for how to bring about success in war.⁸ He contended that success is the result of linking the principles of war into a cogent framework for operations, from the strategic to the tactical levels. He saw this as:

[Advancing] against the enemy's main force (objective), with the intention of destroying it (offensive) with the greatest strength possible (concentration and economy of force), with the least friction (cooperation) in the shortest time possible (movement), so that it may be taken unawares (surprise) without undue risk to ourselves (security).⁹

Cognizant of the tribulations associated with linear interpretations of success in war, Fuller suggested that a commander's ability to apply the art of war was vitally important in relation to the principles and their success in armed conflict. He defined the art of war as, "The art of imposing one's will on an enemy or reducing him to such a state of disorganization and demoralization that he is unable to either strike out or guard himself."¹⁰ The commander's ability to appropriately arrange the principles in an adversarial and learning environment, not in a singular dogmatic fashion, is the acme of the art of war and the key to effectively employing the principles of war.¹¹

The British Army incorporated Fuller's principles into its second volume of the 1924 edition of its Field Service Regulation.¹² However, by 1926, Fuller had updated his work again. During the revision process, he came to believe that economy of force was not just a principle of war, but instead elevated it to an immutable law of war. (Although no concept in war is truly universal or unquestionable, theorists, historians and practitioners like to weight preferred concepts heavier than others, which is why students of war will sometimes find a distinction between principles and laws of war.) Subsequently, he removed it, replacing it with distribution.¹³ Additionally, Fuller felt that cooperation no longer met the threshold required to be a principle of war, so he struck that from the concept, instead adding endurance and

determination.¹⁴ The 1926 principles of war, formally captured in Fuller's *The Foundations of the Science of War*, are direction, concentration, distribution, determination, surprise, endurance, mobility, offensive action and security (see Figure 1).¹⁵

Principle Development in the U.S. Army

Around the time J.F.C. Fuller published *Foundations*, the U.S. Army adopted his principles of war into its own operations doctrine.¹⁶ These principles affected U.S. Army doctrine to varying degrees over the course of the 20th century. For example, the U.S. Army's *Operations* manuals from the 1930s and 1950s did not list the principles of war as a distinct category, but they did use the principles to guide the discussion around the conduct of war and the exercise of command.¹⁷

The 1960s era iterations of Field Manual (FM) 100-5, *Operations*, reflected a distinct change in the principles of war's position of prominence in doctrine. In both the 1962 and 1968 updates to FM 100-5, they were categorized as, "Fundamental truths that govern the prosecution of war."¹⁸ Nevertheless, the 1976 edition of FM 100-5 makes no mention of the principles of war as a comprehensive body, although they are found individually sprinkled throughout the publication.¹⁹

By 1986, the Army reverted again to calling the principles of war timeless, positing that they have stood, "the tests of analysis, experimentation, and practice," and, as such, should be viewed as central to how the Army thinks and fights.²⁰ Furthermore, the 1986 FM contended that the principles are applicable at the strategic, operational and tactical levels of war, and it provided a detailed description of each principle to support this assertion.²¹

In the meantime, the principles of war continued to float around Army doctrine, but in a greatly diminished place of importance. For instance, the 1993 edition of FM 100-5 classified the principles as one of two foundations of Army operations, the other being the Tenets of Army Operations.²² Ironically, the manual's authors and editors missed the fact that the words tenet and principle are synonyms for one another, thereby muddying the distinction between the principles of war and Tenets of Army Operations.

During the chaotic years following 9/11, the principles of war experienced their first major adjustment since their incorporation into U.S. military doctrine. First, the concept was renamed. Principles of War, which pointed to a broad strategic utility, changed to Principles of Joint Operations, which suggested a far narrower warfighting applicability. Second, American warfighting in Iraq and Afghanistan, and the challenges of those irregular wars, resulted in the addition of three principles—restraint, perseverance and legitimacy. Third, and perhaps most important, the principles were subordinated to Operational Art, thereby further obscuring them and reducing their place of prominence in military thought and doctrine.

Modern Development with Robert Leonhard

Meanwhile, writing in 1998, American theorist Robert Leonhard attacked the concept of principles of war head-on in his book *The Principles of War for the Information Age*. He offered several justifications for this. First, he said that the principles are not unchanging.²³ As is evident from the earliest days of J.F.C. Fuller's evolutions up through the U.S. military adding three principles during the post-9/11 wars, they are a modifiable construct. Second, the principles are not universally accepted.²⁴ While the United States and the United Kingdom's principles of war happen to align closely, this is not the case for all actors.²⁵ Third, periodic

Figure 2

Robert Leonhard's Principles of War for the Information Age

Principle of War		Principles of Aggression	
<i>Principle 1</i> Dislocation & Confrontation	Knowledge	Dislocation: The more one knows about oneself, the enemy and the environment, the better one can render enemy strength irrelevant.	
	Ignorance	Aggression: The less one knows about oneself, the enemy or the environment, the more likely one is to have a precipitous meeting with that enemy.	
<i>Principle 2</i> Distribution & Concentration	Knowledge	Distribution: The more one knows about oneself, the enemy and the environment, the better one can temporally and spatially disperse to combat an enemy.	
	Ignorance	Concentration: The less one knows about oneself, the enemy or the environment, the more likely one is to have to concentrate force against an enemy.	
Principle of War		Principles of Interaction	
<i>Principle 3</i> Opportunity & Reaction	Knowledge	Opportunity: The more one knows about oneself, the enemy and the environment, the better one can create opportunities for success and dictate the terms of combat on the enemy.	
	Ignorance	Reaction: The less one knows about oneself, the enemy or the environment, the more likely it is that one will end up reacting to a proactive enemy.	
<i>Principle 4</i> Activity & Security	Knowledge	Activity: The more one knows about oneself, the enemy and the environment, the better one is able to apply initiative and pursue its objectives.	
	Ignorance	Security: The less one knows about itself, the enemy or the environment, the more likely one is to conduct operations to protect oneself at the expense of advancing the plan.	
Principle of War		Principles of Control	
<i>Principle 5</i> Option Acceleration & Objective	Knowledge	Option Acceleration: The more one knows about oneself, the enemy and the environment, the better one can create multiple options that open up multiple avenues to success.	
	Ignorance	Objective: The less one knows about oneself, the enemy or the environment, the more one must focus on a clear endstate.	
<i>Principle 6</i> Command & Anarchy	Knowledge	Command: The more one knows about oneself, the enemy and the environment, the better suited one is to make economically wise command decisions.	
	Ignorance	Anarchy: The less one knows about oneself, the enemy or the environment, the more one must make uneconomical command decisions.	

Knowledge—what we know about ourselves, the enemy and the environment.

Ignorance—what we do not know, what we cannot know or what we chose not to know.

Together, knowledge and ignorance form an independent principle of war; drawn from the laws of humanity, economy and duality, this independent principle is the mainspring for the other six principles of war.

reexamination of ideas in light of evolving operating environments is vital to staying competitive, from the strategic to tactical levels.²⁶ Fourth, despite the call for strategic and operational utility, Leonhard contends that the principles of war are tactical ideas that commanders should apply when they find themselves in direct contact.²⁷ Consequently, as technology, the operating environment and threats evolve, so should the principles of war. To this point, Leonhard posits that it is a self-delusional failure to not revisit the principles and make necessary updates; it would induce failure to blindly accept the principles as they are.²⁸

Leonhard's study results in a recommended overhaul of the existing principles of war. His recommendation rests on the argument that three immutable laws govern war—the laws of humanity, economy and duality.²⁹ The law of humanity emphasizes that war is a byproduct of the human experience and the nature of human beings.³⁰ The law of economy dictates that, to prevail in conflict, an actor must judiciously employ its personnel, equipment and other resources

because of those resources' finite character.³¹ The law of duality asserts that war is bifurcated and that war has both a subjective and an objective component. Balancing those two components—and understanding which component is most important during war—is vital to success.³²

Building on these three laws, he moves to a revision of the principles and a framework for them. Within the foundation of the laws of war, Leonhard identifies four primary principles: knowledge and ignorance; aggression; interaction; and control.³³ Of those four, knowledge and ignorance together make up an independent principle, while the other three incorporate subordinate principles that embody the law of duality's reciprocity: aggression incorporates dislocation-confrontation and distribution-concentration;³⁴ interaction incorporates opportunity-reaction and activity-security;³⁵ and control incorporates option acceleration-objective and command-anarchy (see Figure 2).³⁶

Leonhard's revamped principles provide an astute recommendation for addressing a vastly evolved strategic and tactical environment from that which J.F.C. Fuller used when developing the commonly accepted principles of war. In a similar vein, the current international security environment, embodied by an emboldened Russia, China and Iran, and a widely distributed American military effort, necessitates a fresh look at the principles of war.

Furthermore, the lack of a coherent American military or U.S. Army warfighting doctrine since the end of AirLand Battle suggests that the military is not thinking clearly about the security environment or how to approach war in a multipolar threat environment. Instead of a coherent doctrinal framework that considers the reality, contours and hard constraints of strategic actors and the associated security environment, discourse today is dominated by a byzantine array of concepts haphazardly slapped onto an overly futurist interpretation of future war; meanwhile, it does not account for the determinant effect that systems possess in the conduct of war.

Considering this situation, an amended set of principles of war and a guiding set of assumptions are needed to provide direction and boundaries for thinking about the wars of today and tomorrow and for how LSCOs fit in. What follows first, then, is a series of seven overarching assumptions and a revised set of nine principles of war, based upon a systems-dominated international security environment. These assumptions and principles jettison much of the jargon currently bound up in U.S. military thought because of the cognitive bias and anchoring associated with them. Second, once these revised assumptions and principles are in hand, they can guide the building and the animation of a basic warfighting framework for LSCO—this framework is also proposed in the following pages.

Revisiting the Principles of War

The purpose of revisiting the principles of war is to make them more strategically and operationally useful for today's systems-dominated security environment, supporting the development of a warfighting doctrine by providing a useful framework for understanding systems-dominated war.

- **Assumption 1: War is a competition between two or more actor's systems.** These systems consist of the combined political, military, economic and coalition depth and breadth an actor can, or is willing to, bring to bear in armed conflict. Each actor operates as an open system, capable of learning, and thus does not operate in a deterministic fashion.³⁷ Open systems operate independent of the system's initial conditions and are instead determined by that system's rates of reaction and rates of transport.³⁸ Moving the idea of open

systems to war, strategic depletion is the primary means by which to overcome an adversary's system. Strategic depletion is the focused use of war—through strategy, operations and campaigns—to drive the depletion of an actor's physical capabilities and resources, as well as adversarial will. This is done through the thoughtful use of sub-optimization, time and activities that come at a high cost for an adversarial actor. Depletion is driven by operational exhaustion, and operational exhaustion is animated by tactical overmatch and destruction.

- **Assumption 2: Self-preservation is the first rule and highest policy objective of any actor in war.**³⁹ Therefore, any actor—strategic, state, non-state or otherwise—will not intentionally act in such a way as to jeopardize its long-term well-being.⁴⁰ Any action that runs counter to this assumption is likely the product of one's own incomplete information about its opponent, that opponent's capabilities, resources, will or self-assessment.
- **Assumption 3: A strategic actor will not operate in war in a way that makes it vulnerable to decisive, quick defeat.** This is because of the second assumption, namely, that self-preservation is the highest policy objective. Therefore, concepts, doctrines, strategies or plans built on the idea of quick wins or decisive victory are heedless and must be avoided. Instead, an actor must think in terms of defeat across the breadth and depth of an opponent to accelerate exhaustion and strategic depletion.⁴¹ Linked and flowing campaigns, transitions, branch plans and sequels are critical to effect adversarial system collapse.
- **Assumption 4: All systems in war are open systems, meaning that they sense, reflect and adapt (i.e., learn),⁴² avoiding destruction at all cost.** Therefore, one must not take initial success or failure in a battle or campaign as a portent of immediate strategic success, quick victory or rapid strategic collapse. Moreover, because systems learn, the worth of successful first battles is often of more value to the losing actor than it is to the winning actor; success in first battles should be taken with a grain of salt.
- **Assumption 5: Information, by reason of feedback loops, fuses a system and makes it operate as designed.** Therefore, inducing bad information (i.e., biased, incomplete, scattered and wrong) or incorrectly timed information (i.e., delayed, too late to matter) into a system will drive system sub-optimization.⁴³ System sub-optimization, though not unilaterally fatal, can help speed an actor toward exhaustion through incorrect signals and feedback across the system.
- **Assumption 6:** Because of Assumptions 2 and 4, **all actors will:**⁴⁴
 - **pursue stasis in war as a first order priority**—the system will always place its own welfare and fitness alongside accomplishing its mission;
 - **avoid existential crisis;** and
 - **maintain the system's fitness** by killing off any dead, dying or over-burdensome element within it.⁴⁵
- **Assumption 7:** Building on Assumption 6, **an actor will not fight in the ways in which its adversary wishes it to fight.** Therefore, concepts, doctrine, plans and mental models must account for an intelligent adversary that continually seeks victory and avoids activities that jeopardize its continued existence.

With these assumptions in hand, it is possible to introduce an amended set of principles of war. Breaking from J.F.C. Fuller, these principles are not a formula to follow, but instead a

set of waypoints to assist policymakers, strategists and practitioners to think clearly both about how systems-based war *is* conducted and how it *should be* conducted. The following principles are not values-based concepts, but instead are data-based. To put it another way, these principles are not aspirational ideals, but realist interpretations of how to succeed in war.

Principles of War

Principle 1: Pragmatism. This is a mindset. The goal of war, from the strategic level to the most finite of tactical engagements, must always be victory. Victory can be defined numerous ways, but if actors are not engaged in a war to accomplish their respective objectives, then they are fruitlessly wasting lives, resources, will and credibility. Furthermore, engaging in war without pragmatically pursuing victory exposes an actor’s weaknesses, vulnerabilities, leadership, tactics and doctrine, not only to the opponent with whom they are engaged, but to any other actor interested in paying attention. Additionally, fighting in the way that works is more important than fighting in the way that an actor prefers; therefore, an actor must never allow conceptual or doctrinal preference to supersede the most direct or effective (and legal) path to victory.

Principle 2: Unpredictability. This is the application of pragmatism. Actors must move unpredictably; predictability makes them much easier to defeat. Like a quarterback in American football who telegraphs a pass and so enables an interception, an actor must not telegraph strategy or plan.

The U.S. military’s infatuation with the phases of joint operations is an example of predictable thinking. Joint Publication (JP) 3-0, *Operations*, continues to rely on a preferred and publicly available method of phasing joint operations—shape, deter, seize the initiative, dominate, stabilize, enable and shape.⁴⁶ Despite the 2017 edition of JP 3-0 adding the word “notional” to the phases of joint operations and suggesting that the form described within the publication is just one example, the concept’s continued existence within the publication, notional or not, provides tacit approval for those phases as the preferred sequence of joint operations. The attachment of the word “notional” to the concept does not remove the concept from doctrine, nor does it disassociate the concept or its place in JP 3-0 from the concept’s enduring relationship with graduates from the U.S. military’s General Staff Colleges and War Colleges.

At the tactical level, this resonates through the sequence of the offense and of the defense, a heuristic one often finds taught in the Maneuver Captains Career Course and that is based on concepts articulated in FM 3-90-1, *Offense and Defense*. For example, FM 3-90-1 prescribes the following sequence for offensive operations:

- movement from the assembly area to the line of departure;
- maneuver from the line of departure to the probable line of deployment;
- occupy a support by fire;
- conduct breach or gap crossing;
- assault the objective;
- consolidate on the objective; and
- exploit success or pursue a withdrawing enemy.⁴⁷

The use and abuse of these sequencing models can, and does, lead to linear thinking about operations and activities. This not only makes an actor predictable, but also subject to surprise, because of the incipient effect that these models can have on how an actor views or portends

adversaries' activities in war. Surprise, as noted by military historian and theorist Trevor Dupuy, is one of the two primary reasons an actor loses in war.⁴⁸

Principle 3: Information. Information is a system's lifeblood—a system will either live or die based on the information cycling through the system.⁴⁹ Indeed, systems theorist Donella Meadows posits that, "Missing information flows is one of the most common causes of system malfunction."⁵⁰ Additionally, a general principle regarding information and feedback loops postulates that, "The information delivered by a feedback loop can only affect future behavior; it can't deliver the information, and so can't have an impact fast enough to correct behavior that drove the current feedback."⁵¹

Information is transmitted through systems via two types of feedback loops—balancing feedback loops and reinforcing feedback loops.⁵² Reinforcing feedback loops are self-reinforcing and instruct a system to continue doing what it is doing.⁵³ This is both good and problematic. When a system finds success, reinforcing feedback loops cause discrete success to snowball into general victory. On the other hand, if bad information is caught in a reinforcing feedback loop, the information can amplify the negative effect of that information. If left unchecked, this can cause a system to descend into a death spiral.⁵⁴

In contrast, balancing feedback loops are self-correcting and work to offset the negative effects of reinforcing feedback loops. Balancing feedback loops are goal- and stability-seeking. System survivability and equilibrium (i.e., the economic application of resources and information throughout the system) are the goals pursued by balancing feedback loops.⁵⁵

Information manipulation—to include inducing information lag, bad information and delayed or distorted information into a system—can cause unique problems for that system and provide a source of instability.⁵⁶ This problem is compounded when the information has to move through many layers of bureaucracy, further delaying its transmission, distorting its data and allowing for misconstruction of timing and meaning.

Therefore, manipulation of an adversary's information, while protecting the integrity of one's own information and information transmission systems, is critical in war. To borrow from the computer science field, garbage into the system produces a garbage out effect. An actor must try to contribute to the garbage going into and throughout an adversary's system, while being watchful of its own information.

Principle 4: Sustainment. Systems consist of subsystems. Systems and subsystems must communicate to maintain balance. While communication—and, by extension, information—serves as the cognitive foundation for system balance, sustainment is the physical manifestation of the pursuit of system equilibrium. Therefore, sustainment is something an actor must aggressively target but also protect.

Attacking a system's interconnections must be a goal, as this can cause the system to change dramatically.⁵⁷ Sustainment suboptimization, coupled with information suboptimization, and the tactical destruction of personnel and equipment, is the most likely path to subsystem exhaustion and system depletion. Resultantly, sustainment and feedback nodes that send, receive and process information are important targets in the conduct of war. Therefore, mapping an adversary's system to identify those nodes and loops is a critical function for an actor in war. It can help to identify existing and potential limitations and bottlenecks, which can serve as conduits to triggering exhaustion and depletion across an actor's subsystems and systems.

Conversely, an actor should also map their own network to identify how and where a skillful actor will potentially strike. Few actors, even in LSCOs, are going to willingly attack an adversary head-on. Instead, they too will target sustainment and feedback loops to suboptimize their adversary in pursuit of exhaustion and depletion.

The goal with sustainment, as it applies to an adversary, is to drive suboptimization to the point that it, coupled with information suboptimization and tactical destruction, exceeds an adversary's ability to address those problems—and this causes that adversary to collapse. At the higher end of tactical operations, through the theater levels, this is the concept of exhaustion; at the global level, this is depletion. By the other side of the token, in LSCOs, actors and their allies must operate in such a way as to parry sophisticated attacks on their sustainment network. The following equation is a useful heuristic for envisioning and planning for resource expenditure (a key component of sustainment) in war:

Resource expenditure in an adversarial context (Rx) is equal to the quantity of one's force (Qf) plus one's frontage (Ft) plus the number of points of enemy contact along that front (Pc) plus the duration of enemy contact (Dr), divided by one's on-hand resources (Re) plus an actor's ability to replenish those resources (Rp): $Rx = (Qf + Ft + Pc + Dr) \div (Re + Rp)$.⁵⁸

Principle 5: Redundancy. Time and the history of war have proven that short, decisive battles that usher in strategic victory are exceedingly uncommon.⁵⁹ They have become even more uncommon as actors have diversified their sustainment networks, become more reliant on alliances and coalitions to augment their own shortcomings, and have begun to incorporate multiple arms, services and domains into how they wage war. Wars against non-state actors, especially in the post-Cold War era, are even more problematic because they are anything but decisive or short. To this point, historian Cathal Nolan cautions, “We must keep our eyes open to the grim reality that victory was usually achieved by grinding attrition and mass slaughter.”⁶⁰ Therefore, planning and thinking in terms of short, decisive wars is a fool's errand; it must be avoided at all costs.

Similarly, systems theory contends that ideas such as calibrated resourcing and just-in-time logistics makes a system more fragile, more prone to shock and, subsequently, more susceptible to failure.⁶¹ So, despite the capital savings of just-in-time logistics or calibrated force posture, redundancy is more important to system adaptation and survivability than cost-saving measures.

Redundancy enables a learning system to patch parts or portions of a system that experience deleterious effects brought about through the rigors of combat. Furthermore, it enables follow through—it allows for planning and conducting operations in depth, whereas the lack of redundancy allows for lock-step sequential planning and operations. In war among competing systems, follow-through is important because it supports the constant, pervasive pressure needed to overcome an adversarial system.

Redundancy, in sum, is two-fold. It allows an actor to weather an aggressive enemy onslaught without welcoming system or subsystem failure. Concurrently, like water breaking free from a dam, redundancy supports flow-in tactical and operational activity along the path of least resistance. Without redundancy, an actor has limited options to exploit success or to stave off potential disaster.

Principle 6: Overwhelm. Because information plays such a critical part in war among systems, and because it is vital to maintaining balance between a system and its subsystems,

overwhelming a system's ability to handle information is critical to defeating an adversarial system. While Western militaries are fond of the idea of imposing multiple dilemmas on an opponent, in many cases, this has a reciprocal effect in terms of unintended consequences and command and control on the purveyor.

Overwhelming an opponent, on the other hand, sidesteps the refractive problems of multiple dilemmas. It does so through packaged activities that foist more decisions and information on an adversary than it can handle, thereby denying its ability to drive self-regulation. Taking the principle of overwhelming a step further, its extended goal is to immobilize an opponent, pinning it in either a single cognitive or physical location, making it even more susceptible to physical destruction.

Planning and operating in discrete terms, through zones of proximal dominance, is one way to overwhelm an adversary. Dominance (D) equals one's resources (Re) plus time (Ti), divided by enemy action (En) plus self-sustainment (Su): $D = (Re + Ti) \div (En + Su)$.⁶² The targeted employment of dominance, oriented on weaker forces, on sustainment and information nodes and on feedback loops, is one way in which zones of proximal dominance can assist in overwhelming an actor, fixing it in place and assisting in advancing subsystem and system collapse.

Conversely, an actor must consciously act to avoid stumbling into or driving its own inundation. For instance, an actor must not let existing doctrines or accepted practices step between it and maintaining cognitive, physical and resource flexibility and mobility.

Principle 7: Mobility. British theorist B.H. Liddell Hart correctly asserts: "Mobility means, and needs, much more than mere movement along the road or over the ground."⁶³ Mobility is critical in war, whether that be strategic mobility or tactical mobility. Its value resides in its connection to generating options and providing an actor more than one way in which to think, fight, move and plan. Furthermore, immobility makes an actor an easy target. Immobility can be both physical and cognitive. Cognitive immobility—boxing an actor into one or few options—makes their future actions predictable and therefore far more susceptible to pre-planned destruction.

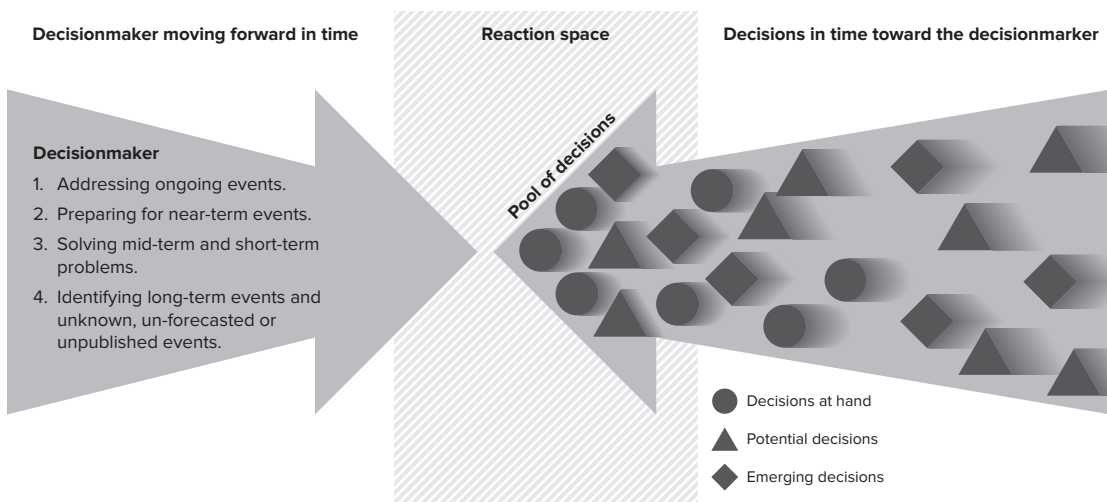
Principle 8: Transitions. Napoleon Bonaparte stated: "The secret of war is to march twelve leagues, fight a battle, and march twelve more in pursuit."⁶⁴ Bonaparte, in effect, attested to the veracity of transitions in each element of his assertion: movement to battle, the transition from movement to battle and battle to movement, and the cognitive shift from battle to exploitation. Furthermore, Bonaparte's statement affirms the relationship between momentum through progressive transitions and generating the snowballing effect therein to trigger subsystem and system collapse.

Ironically, because of the predictability of operational phasing and sequence at the joint and tactical levels, transitions tend to be known unknowns—an actor is often aware of the required transitions of an operation, but typically does not know when or where they will occur. Nevertheless, thorough planning can account for much in relation to transitions and reserves, which are two sides of the same coin. The initiation of a transition or the commitment of a reserve must be tied to decision points developed during planning. Finding answers to these decision points must be linked with a system's feedback loop process; it cannot be the sole responsibility of one organization or one capability.

Five basic transitions accompany most operations: 1) transition from movement to attack or defense; 2) transition from attack to defense; 3) transition from defense to attack; 4) transition

Figure 3

Timeliness and Just-in-Time Decisionmaking



from an existing form of warfare to a pursuit; and 5) transition from one form of warfare to a retrograde or withdrawal.⁶⁵ These should be added to planning priorities, both for an actor's own benefit and for more effectively thwarting an opponent.

Reserves are a critical capability for transitions. A reserve's employment is generally tied to one of three options: 1) exploiting tactical or operational success; 2) overcoming an initial failure toward mission accomplishment or attaining an objective; and 3) initiating a pre-identified transition.⁶⁶ As with the five basic transitions, adding these three reserve planning considerations to planning priorities will assist a planning team in accounting for reserve employment and its integration with transitions.

Principle 9: Timeliness. A cottage industry exists around the idea of "just-in-time decisions," which is the unfounded assertion that leaders possess the luxury of making decisions whenever they are inclined or when their staffs instruct them that it is the "right time." However, this is an illogical habit that was picked up and inculcated during the U.S. military's long period of indoctrination in Afghanistan and Iraq. War among thinking, learning and adapting systems demands timely and correct information, which, in turn, necessitates early and thoughtful decisionmaking.

Lieutenant General George Patton and 3rd Army's flexibility at the outset of World War II's Battle of the Bulge is a classic example that supports this assertion. At the outset of the German's Ardennes offensive in December 1944, Patton, sensing the specter of something more ominous than a localized attack, instructed his 3rd Army staff to develop three options focused on deftly repositioning 3rd Army some ninety miles north of its position to assist Lieutenant General Omar Bradley's 1st Army at the Bastogne-St. Vith sector.⁶⁷ Patton's timely thinking proved providential at an emergency planning conference a few days later. Summoned to Verdun by General Eisenhower on December 19, Patton was the only commander capable of providing Eisenhower with useful options that helped to triage the calamity in the Ardennes and turn the tide of the situation in favor of the Allies.⁶⁸

Time and decisions are not isolated events, nor are they neutral. Decisions, potential decisions, and the interconnection among them require forethought and action, with adequate space to allow them to influence any given situation. As system theory contends, just-in-time decisions often do not have the necessary time to influence feedback loops and allow for their first, second and third order effects to promulgate throughout a system. They do not support system equilibrium or system suboptimization for an adversary.

Furthermore, time and the suite of available decisions are continually moving toward a decisionmaker, and all the while the decisionmaker is moving toward those decisions (see Figure 3). As one moves closer in time toward an event, or its associated decisions, time appears to accelerate. This feeling is the result of several factors. The decisionmaker is addressing ongoing events, as well as preparing for near-, mid- and long-term events. Adding late, complicated decisions, or a multitude of decisions to the docket at the last moment, tends to negatively impact all of those factors and to leave an actor in a reactive posture.

Transitioning the Principles of War into a Framework for LSCOs

Transitioning the principles of war from esoteric concepts to a useful framework for war and LSCOs is the next salient step in reestablishing the principles' importance in military thought. The previously annotated assumptions are a critical tool in this process because they enable the establishment of a foundation of war. The assumption's reliance on systems infers that sub-systems exist as one moves down the scale of war from the policymaking level to the most finite tactical element. Taking this assertion a step further, the current levels of war—strategic, operational and tactical—overlook a system- and subsystems-oriented framework. A systems-oriented position suggests that there are also political, theater strategic and high tactical levels of war, each with discrete reach, character and purpose.

Global Reach

Global reach consists of the political and strategic levels of war. The conceptual focus at those levels should be developing achievable policy objectives, orienting strategic sustainment on par with those policy objectives, and forming any needed coalitions or alliances. Strategic leaders must focus on allocating strategic and theater main efforts, supporting efforts and generating reserves. Additionally, they must ensure that they provide the theater with the resources it needs to accomplish the strategic and policy objectives assigned to it.

The purpose at the political level is to arrive at conditional surrender. History demonstrates that policy objectives focused on unconditional surrender tend to cause an adversary to fight longer than they would if conditional surrender options were offered.⁶⁹ Furthermore, recent history illustrates that decapitation and annihilation strategies, much like the idea of swift, decisive victory, are also a fool's errand and should be avoided at all cost.

Depletion, or the existential consumption of fixed resources across an adversary's strategic depth, is the goal for triggering conditional surrender. At the strategic level, this manifests in the collapse of its system and subsystems due to the inability to supply its war effort.

Theater Reach

Theater reach consists of the theater strategic and operational levels of war, which is a break from existing U.S. military doctrine. In LSCOs, in which many army groups, field armies and corps will likely find themselves employed, the current strategic-operational-tactical

Figure 4

A Framework for Large-Scale Combat Operations

Reach	Level of War	Players (U.S.)	Conceptual Forces
Global	Political	President of the United States, Congress	<ol style="list-style-type: none"> 1. Policy objectives 2. Will – political and domestic 3. Strategic sustainment 4. Coalition building
	Strategic	Civilian Pentagon leaders, Joint Staff Service Secretaries	<ol style="list-style-type: none"> 1. Allocation of strategic main effort and supporting effort theaters 2. Strategic sustainment; 3. Resource allocation in support of strategic operational framework 4. Initiate military coalition
Theater	Theater Strategic	Combatant Commanders, Department of State; Coalition	<ol style="list-style-type: none"> 1. Identify theater main effort and supporting effort; develop campaign plan (CAMPLAN) 2. Theater sustainment 3. Resource allocation in support of operation framework 4. Maintaining military coalition
	Operational <i>(depends on size of fielded force)</i>	Army Grps, Corps, Field Armies; Coalition, Joint Force	<ol style="list-style-type: none"> 1. Tactical action to accomplish CAMPLAN (becomes operation plan) 2. Tactical main effort and supporting effort to accomplish CAMPLAN 3. Sustainment to accomplish CAMPLAN
Battlefield	High Tactical <i>(depends on size of fielded force)</i>	Corps, Divisions	<ol style="list-style-type: none"> 1. Destroy the enemy 2. Obtain territory
	Tactical	Divisions, Brigades, Battalions, Companies	<ol style="list-style-type: none"> 1. Destroy the enemy 2. Obtain territory

framework is insufficient because it puts too much onus on too few headquarters. In effect, the current framework violates several of the principles of war discussed in detail in the preceding pages. Therefore, to prevent any level of war, headquarters, or feedback loop from becoming overwhelmed, it is imperative to separate the strategic and operational levels of war into discrete strategic, theater strategic and operational levels.

This is not a new idea; in fact, it played out many times during World War II. For example, following Operation Overlord in Western Europe, the European Theater, commanded by General Dwight Eisenhower, contained three Army Groups—21st Army Group, 12th Army Group and 6th Army Group. The 12th Army Group, commanded by Lieutenant General Omar Bradley, consisted of several armies.⁷⁰ Each of those armies consisted of a set of corps, which contemporary doctrine typically aligns as the operational level of war, while each of those corps consisted of a set of divisions.⁷¹ In that configuration, Eisenhower’s headquarters served as the theater strategic headquarters, the three army groups served as operational headquarters, and the multitude of armies, corps and divisions were high tactical and tactical headquarters.

The conceptual focus at the theater strategic level is developing the theater campaign plan, allocating main efforts, supporting efforts and reserves to accomplish the campaign plan, and coordinating and allocating sustainment capabilities to enable that plan. Furthermore, the theater strategic headquarters is charged with maintaining the integrity of any military alliance or coalition. At the operational level, the conceptual focus is bridging the theater strategic

	Tool to Win	Physical Focus	Purpose
	Depletion 1. Strategic depth 2. Political and domestic will 3. Coalition support	1. Political and domestic will 2. Alliances or coalitions 3. Support from external actors	Conditional Surrender * Decapitation and annihilation strategies are dominated strategies.
	1. Depletion – the strategic depth 2. Exhaustion – the operational system	Strategic Reserves 1. Men 2. Material 3. Shipping	Strategic depletion – Strategic actor unable to continue supplying war effort; collapse of military coalition due to strategic exhaustion
	Exhaustion 1. Men 2. Material 3. Will – political, domestic, allies	Exhaust the enemy’s operational system to the point that it is incapable of sustaining military operations.	Theater-system collapse
	Exhaustion 1. Men 2. Material 3. Will – political, domestic, allies	Exhaust the enemy’s system to the point that it is incapable of sustaining military operations.	Sub-system(s) collapse – there can be more than one sub-system
	Overmatch 1. Zones of proximal dominance 2. Mobility 3. Pragmatism	Destroy components of combat power to induce op level to exhaustion	Increase the enemy’s costs to induce collapse; disrupt feedback loops
	Overmatch 1. Zones of proximal dominance 2. Mobility 3. Pragmatism	Destroy components of combat power to induce op level to exhaustion	Increase the enemy’s costs to induce collapse; disrupt feedback loops

campaign plan with the actions on the ground, within that operational headquarters’ area of responsibility, that accomplish the theater strategic headquarters’ military objectives. As with each headquarters above and below it, the operational headquarters also assigns main efforts, supporting efforts, reserves, and coordinates and allocates sustainment to accomplish its plan.

The purpose of military operations at the theater strategic level is to induce adversarial system collapse across the theater. At the operational level, the purpose is to bring about subsystem collapse, which, when synchronized across a theater, should drive theater strategic system collapse. This is accomplished through the exhaustion of an adversary’s personnel, materiel and will—i.e., draining the enemy’s subsystems to the point that they are incapable of sustaining military operations.

Battlefield Reach

Battlefield reach consists of the high tactical and tactical levels of war. The high tactical level of war includes corps and divisions, because the tactical activities that they are charged with in LSCOs differ greatly from those of brigades, battalions and companies. However, depending on the situation and task organization of a given formation, divisions might serve as purely tactical formations.

Activities at the high tactical and tactical levels of war are straightforward—the conceptual focus for these formations is threefold: destruction of the enemy; obtaining territory; or

destruction of the enemy *and* obtaining territory. The purpose of the high tactical and tactical levels is to increase the costs of war, to disrupt or dislocate feedback loops, and to consume an adversary's resources. While the political and strategic levels focus on depletion, and exhaustion straddles the strategic to operational levels, the high tactical and tactical levels focus on localized overmatch to accomplish its purpose. Figure 4 provides a comprehensive framework to assist in visualizing this concept.

Conclusion

Today's vast array of operational and tactical concepts, detached from a taxonomy for war, demonstrates a cloudy appreciation for the character of war. War today, and in the future, is a contest of dynamic, thinking systems that are capable of learning, self-organizing and self-maintaining. Armed conflict among adversarial systems—which today are robust, redundant arms of foreign policy, and not brittle, weak-spirited implements of cowardly leaders—requires concepts and doctrines that lack systems thinking. Despite this reality, many warfighting and battle-fighting concepts currently floating around Western military thought fail to accept this reality. Instead, these concepts rest on unfounded cognitive cults, such as the short war cult and the first battles cult. Moreover, fundamentally tactical ideas, like overmatch or decision dominance, are incorrectly expressed as keys to strategic victory.

Arguably, the misappropriation of concepts is due to the lack of structural coherence vis-à-vis systems' central position on the character and conduct of war. However, as described within this work, structural coherence is achievable. J.F.C. Fuller's principles of war and, importantly, the logic that Fuller imbued within those principles to build a general framework for war, are a foundational place to start to build war's taxonomic coherence. Yet, as both Fuller and Leonhard's works demonstrate, the principles of war are not calcified concepts that provide a guiding arc through time of the proper conduct of war. Instead, they both contend that principles of war, serving as the baseline for the theory and practice of war, are a living, breathing, malleable tool used to address war in a specific context.

Taking Fuller and Leonhard's proposition at face value, this work offers an amended set of principles and guiding assumptions for war. When taken in consideration of their underpinning assumptions, the amended principles of war—pragmatism, unpredictability, information, sustainment, redundancy, overwhelm, mobility and transitions—provide the cognitive foundation for a general framework for war and LSCOs. This framework provides a foundation for MDO, Joint All-Domain Operations and other key and emerging concepts of today's Army.

Notes

- ¹ James McConville, *Multi-Domain Transformation: Ready to Win in Competition and Conflict, Chief of Staff Paper #1* (Washington, DC: Department of the Army, March 2021), 1–14.
- ² McConville, *Multi-Domain Transformation*, 5–9; James McConville, *The Army in Military Competition: Chief of Staff Paper #2* (Washington, DC: Department of the Army, 221), iv–viii.
- ³ Michael Kofman, “A Bad Romance: US Operational Concepts Need to Ditch Their Love Affair with Cognitive Paralysis and Make Peace with Attrition,” *Modern War Institute*, 31 March 2021.
- ⁴ J.F.C. Fuller, *Training Soldiers for War* (London: Hugh Rees, 1914), 41–42.
- ⁵ Fuller, *Training Soldiers for War*, 41–42.
- ⁶ Fuller, *Training Soldiers for War*, 41–42.
- ⁷ Fuller, *Training Soldiers for War*, 41–42.
- ⁸ J.F.C. Fuller, “Gold Medal (Military) Prize Essay for 1919,” *Royal United Services Institution Journal* 65, no. 458 (May 1920): 244.
- ⁹ Fuller, *Gold Medal Essay*, 244.
- ¹⁰ Fuller, *Training Soldiers for War*, 43.
- ¹¹ Fuller, *Training Soldiers for War*, 43.
- ¹² J.F.C. Fuller, *The Foundations of the Science of War* (London: Hutchinson, 1926; reprint, Fort Leavenworth, KS: Combat Studies Institute, 1993), 16.
- ¹³ Fuller, *The Foundations of the Science of War*, 16.
- ¹⁴ Fuller, *The Foundations of the Science of War*, 16.
- ¹⁵ Fuller, *The Foundations of the Science of War*, 15–16.
- ¹⁶ Trevor Dupuy, *Understanding Defeat: How to Recover from Loss in Battle to Gain Victory in War* (New York: Paragon House, 1990), 247–248.
- ¹⁷ The author quarried the Army’s field service regulations and operations manuals (Field Manual 100-5, *Operations*) from 1923 to 1954. The research was conducted through Fort Leavenworth’s Combined Arms Research Library at the following link: <https://cgsc.contentdm.oclc.org/digital/collection/p4013coll9>.
- ¹⁸ Field Manual (FM) 100-5, *Operations* (Washington, DC: Government Printing Office, February 1962), 46; FM 100-5 (Washington, DC: Government Printing Office, September 1968), 5-1.
- ¹⁹ FM 100-5 (Washington, DC: Government Printing Office, April 1976).
- ²⁰ FM 100-5 (Washington, DC: Government Printing Office, May 1986), 6, 173.
- ²¹ FM 100-5, 1986, 173–177.
- ²² FM 100-5 (Washington, DC: Government Printing Office, June 1993), 2–4.
- ²³ Robert Leonhard, *The Principles of War for the Information Age* (Novato, CA: Presidio Press, 1998), 8.
- ²⁴ Leonhard, *The Principles of War*, 8.
- ²⁵ Army Doctrine Publication, *Land Operations* (Waterloo Lines, England: Land Warfare Centre, March 2017), 1A-1–1A-3.
- ²⁶ Leonhard, *The Principles of War*, 8.
- ²⁷ Leonhard, *The Principles of War*, 8–9.
- ²⁸ Leonhard, *The Principles of War*, 9.
- ²⁹ Leonhard, *The Principles of War*, 208.
- ³⁰ Leonhard, *The Principles of War*, 207.
- ³¹ Leonhard, *The Principles of War*, 217.
- ³² Leonhard, *The Principles of War*, 226–227.
- ³³ Leonhard, *The Principles of War*, 251.
- ³⁴ Leonhard, *The Principles of War*, 255–257.

- ³⁵ Leonhard, *The Principles of War*, 258–259.
- ³⁶ Leonhard, *The Principles of War*, 259–261.
- ³⁷ Ludwig von Bertalanffy, *General Systems Theory* (New York: George Braziller, 1968), 39–41.
- ³⁸ Bertalanffy, *General Systems Theory*, 142–143.
- ³⁹ Alexandr Svechin, *Strategy* (Minneapolis, MN: Eastview Information Services, 2004), 248.
- ⁴⁰ Joel Watson, *Strategy: An Introduction to Game Theory* (London: W.W. Norton Books, 2010), 69.
- ⁴¹ Cathal Nolan, *The Allure of Battle: A History of How Wars Have Been Won and Lost* (Oxford: Oxford University Press, 2017), 579–582.
- ⁴² Donella Meadows, *Thinking in Systems: A Primer* (White River Junction, VT: Chelsea Green Publishing, 2008), 39.
- ⁴³ Meadows, *Thinking in Systems*, 172.
- ⁴⁴ Bertalanffy, *General Systems Theory*, 150.
- ⁴⁵ Meadows, *Thinking in Systems*, 83.
- ⁴⁶ Joint Publication 3-0, *Operations* (Washington, DC: Government Printing Office, October 2017), V7–V14.
- ⁴⁷ FM 3-90-1, *Offense and Defense Volume 1* (Washington, DC: Government Printing Office, March 2013), 3–10.
- ⁴⁸ Dupuy, *Understanding Defeat*, 51–54.
- ⁴⁹ Meadows, *Thinking in Systems*, 78.
- ⁵⁰ Meadows, *Thinking in Systems*, 156–157.
- ⁵¹ Meadows, *Thinking in Systems*, 39.
- ⁵² Meadows, *Thinking in Systems*, 48.
- ⁵³ Meadows, *Thinking in Systems*, 48.
- ⁵⁴ Meadows, *Thinking in Systems*, 30–31.
- ⁵⁵ Meadows, *Thinking in Systems*, 28–29.
- ⁵⁶ Meadows, *Thinking in Systems*, 23.
- ⁵⁷ Meadows, *Thinking in Systems*, 16.
- ⁵⁸ Amos Fox, “Getting Multi-Domain Operations Right: Two Critical Flaws in the U.S. Army’s Multi-Domain Operations Concept,” *Association of the United States Army Land Warfare Paper* 133 (June 2020): 9.
- ⁵⁹ Nolan, *The Allure of Battle*, 9–10.
- ⁶⁰ Nolan, *The Allure of Battle*, 577.
- ⁶¹ Meadows, *Thinking in Systems*, 77.
- ⁶² Fox, “Getting Multi-Domain Operations Right,” 3–4.
- ⁶³ B.H. Liddell Hart, *Defence of the West* (London: Cassell and Company Ltd, 1950), 291.
- ⁶⁴ Alan Schom, *Napoleon Bonaparte: A Life* (New York: HarperCollins Publishers, 1997), 275.
- ⁶⁵ Amos Fox, “On the Employment of Cavalry,” *ARMOR* 123, no. 1, (Winter 2020), 37.
- ⁶⁶ Fox, “On the Employment of Cavalry,” 36–37.
- ⁶⁷ Carlo D’Este, *Patton: A Genius for War* (New York: Harper Perennial, 1995), 679–680.
- ⁶⁸ D’Este, *Patton*, 678–681.
- ⁶⁹ B.H. Liddell Hart, *The Revolution in Warfare* (New Haven, CT: Yale University Press, 1947), 50.
- ⁷⁰ Ray Cline, *Washington Command Post: The Operations Division* (Washington, DC: Government Printing Office, 1951), <https://history.army.mil/books/wwii/WCP/AppendixB.htm>.
- ⁷¹ FM 3-94, *Theater Army, Corps, and Division Operations* (Washington, DC: Government Printing Office, April 2014), 1–6.



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