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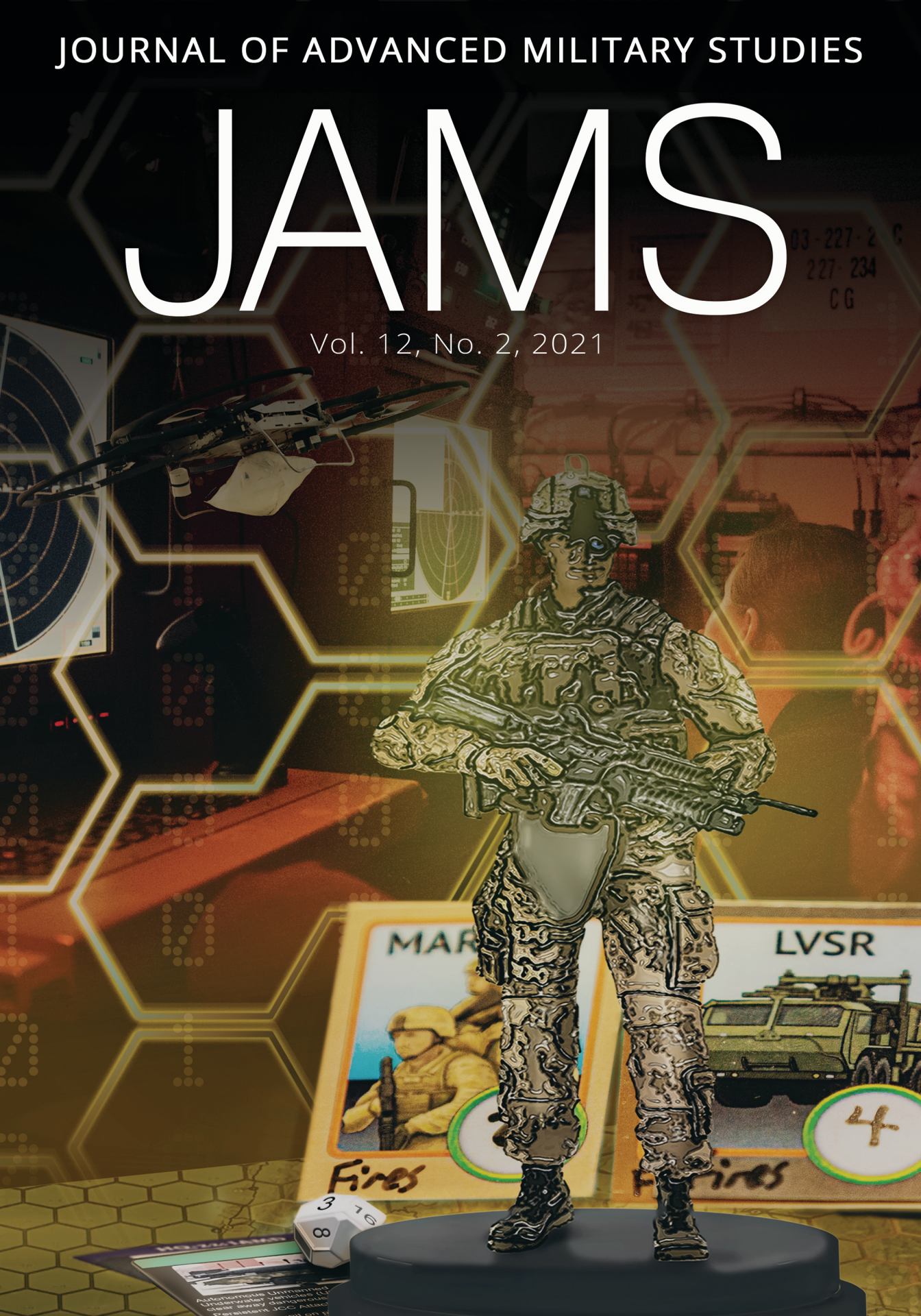

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From the Editors

In 2017, then-Commandant Robert B. Neller reported to the U.S. Congress that the Marine Corps was not prepared for the demands of the future operating environment. This report on the posture of the Corps was meant to defend its 2018 budget request, but it would serve as the platform for future planning guidance to the rest of the Service.[1] More than five years later, Commandant David H. Berger concurs with the 37th Commandant that the Marine Corps has significant challenges ahead if the Service wishes to be prepared for the battles being brought to our shores by near-peer competitors.[2]

General Berger's *Commandant's Planning Guidance* was published in 2019 to illustrate his priority focus areas for the Corps: force design, warfighting, education and training, core values, and command and leadership. Though force design was the Commandant's number one priority, Berger insists that the complexities of the future battlefield require a highly educated force. To that end, Berger directed all formal schools to include a naval orientation and a focus on areas that require the force to think, innovate, and change:

> Essential to charting our course in an era of strategic fluidity and rapid change will be the effective integration of professional wargaming in force design, education, and training.[3]

Though all the Services have made use of wargaming for generations, Berger believes that the Marine Corps has never "harnessed this effort in an integrated process of learning generating tangible, defensible results. This will change."[4] The 2019 planning guidance highlights how Berger intends for the Corps to achieve readiness in this area: 1) create and build a wargaming center on the Marine Corps University campus in Quantico, Virginia; 2) reinvigorate the work of the Marine Corps Warfighting Lab; 3) fully integrate wargaming into force design; 4) ensure that wargaming within training and education fills all gaps in the practice of decision making against a thinking enemy; and 5) make full use of wargaming findings to adapt our concepts and capabilities.[5]

The March 2020 update by the Marine Corps, *Force Design 2030*, reports

on the massive changes taking place to modernize the Corps but also attempts to align the Service with the findings of the *National Defense Strategy*.[6] Though the document highlights the transformation required to pull the Corps away from its 1950 operational mentality, *Force Design 2030* highlights how critical wargaming was to the Commandant's guidance: "war games helped shape my conclusion that modest and incremental improvements to our existing force structure and legacy capabilities would be insufficient to overcome evolving threat capabilities."[7]

In 2020, Acting Secretary of the Navy Thomas B. Modly released *Education for Seapower Strategy 2020* with the intent "to align the policies and resources required to produce a better educated and more agile naval force." The Naval University System—Naval Community College, the U.S. Naval Academy, the Naval War College, Naval Postgraduate School, and Marine Corps University—would be the driving force behind this initiative to create a decisive competitive advantage by:

- Developing leaders and warfighters who possess good judgment, creativity, a commitment to ethics, and excellent analytic and problem-solving skills;
- Providing naval forces with an intellectual overmatch against our adversaries;
- Making the naval force more proficient by improving strategic thinking, increasing geopolitical awareness, building key technical and professional capabilities, and deepening our understanding of the conditions in which military force can be used effectively.[8]

Pillar 3 of the seapower strategy—strengthen and invest in the Naval University System—meant the Department of the Navy intended for the sea Services to be learning organizations and that the best way to achieve this goal was to "develop a more powerful wargaming strategy and create new relationships for intellectual sharing and debate between the Fleets and Marine Operating Forces and our cyber, research, and intelligence enterprises."[9]

What do these foundational documents mean for professional military education (PME) in general and Marine Corps University specifically? It means major cultural and structural changes. First, construction of the Marine Corps Wargaming and Analysis Center began in 2021; and Marine Corps University is in the process of hiring a wargaming director within the Brute Krulak Center for Innovation and Future Warfare.[10] Second, though the 2017–22 *Marine Corps University Strategic Plan* includes goals for PME that foster individuals who think critically and creatively and for state-of-the-art facilities and tech-

nology, the draft plan for the next five years intentionally focuses on the importance of wargaming that is fully embedded in the curriculum.[11]

Given the rate of change taking place within the Corps and the local activity driving university innovation, the editors felt the need to contribute to the debate with a full issue of the *Journal of Advanced Military Studies* (JAMS) that focuses on wargaming and the future of the Marine Corps and the U.S. military. The authors of the articles that follow approached the conversation from a broad scholarly spectrum that offers historical and forward-thinking perspectives.

The first article by Dr. Charles Esdaile, " 'Napoleon at Waterloo': The Events of 18 June 1815 Analyzed via Historical Simulation," offers a historical perspective on the importance of wargaming and professional military education (PME). His article examines how products of the game industry can be used to assess battles and draw out wider lessons relating to the conduct of war or to show how historical board games are not just recreational artifacts but also a tool with which to more fully explore, analyze, and understand campaign design and battle execution.

Sebastian J. Bae and Major Ian T. Brown then provide a transition into a more modern conversation by offering a brief history of educational wargaming specific to the U.S. Marine Corps. The article reviews and assesses the history of educational wargaming from its tentative engagement before World War I through today. It will also offer recommendations on how the Corps can institutionalize the use of educational wargaming as a tool for honing Marines' minds against thinking human adversaries. Our next two articles continue this discussion of wargaming and PME. Colonel Eric M. Walters considers the challenges and solutions presented by wargaming and helps orient those unfamiliar with wargaming and advises on proven best practices in using them when teaching military judgment in decision making. Lieutant Colonel P. C. Combe II shifts then into the design and implementation of wargaming for the purpose of teaching or evaluating the extent to which students have learned and can apply material as a means of professional development.

Kate Kuehn further highlights the importance of evaluating the use of wargaming with her article, "Assessment Strategies for Educational Wargames." Kuehn maintains that by examining the perspectives and practices of experienced faculty within wargaming, she can then identify strategies that can serve as useful teaching tools for other faculty as well as contribute to broader theory about designing assessment in such spaces. Colonel Brian W. Cole's article on the wargame *Hedgemony* focuses on using wargames to then evaluate the learning objectives within senior Joint PME. His article examines how the Marine Corps War College's experience with *Hedgemony* offers active learning for its

students while emphasizing resource management and evaluates how well the game met the educational objectives set forth by the Joint Chiefs of Staff for senior-level PME.

The final two articles in this issue of JAMS close the loop on the PME continuum by focusing on how wargaming complements military decision making and the future development of wargaming focused on the future of warfare. Colonel Walters's article "Developing Self-Confidence in Military Decision Making" highlights how extensive practice through wargaming grows self-confidence in both the individual Marine and in the unit engaged in it. Stephen M. Gordon, Colonel Walt Yates, and Andrew Gordon close out the journal articles by exploring the benefits and challenges of applying successful storytelling techniques to designing wargame narratives that balance creative ambitions with achievable time lines. In the authors' minds, wargames that incorporate such techniques will generate new trends and better inform future conflict planning.

The remainder of JAMS rounds out with a review essay and a selection of book reviews that continues our focus on warfare, but it also highlights continuing challenges in national security and international relations. The coming year will be busy for the JAMS editors as we work to provide journal issues on a diverse range of topics relevant to the study of militaries and defense, including a special issue on strategic culture followed by the Spring 2022 issue.

The Spring 2022 issue of JAMS will open a larger discussion of the historic, contemporary, and future roles of military Services during national emergencies and natural disasters. Contribute to the discussion and submit an article for consideration. We look forward to hearing your thoughts on these topics and to your future participation as an author, reviewer, or reader. Join the conversation and find us online on our LinkedIn page (https://tinyurl.com/y38oxnp5), at MC UPress on Facebook, MC_UPress on Twitter, and MCUPress on Instagram or contact us via email at MCU_Press@usmcu.edu.

Endnotes

1. Statement by Gen Robert B. Neller, Commandant United States Marine Corps, before the Senate Committee on Appropriations Subcommittee on Defense: Review of the FY2018 Budget Request for the U.S. Navy and Marine Corps, 1st Sess., 115th Cong. (24 May 2017).
2. Gen David H. Berger, *Commandant's Planning Guidance: 38th Commandant of the Marine Corps* (Washington, DC: Headquarters Marine Corps, 2019).
3. Berger, *Commandant's Planning Guidance*, 18.
4. Berger, *Commandant's Planning Guidance*, 18.
5. Berger, *Commandant's Planning Guidance*, 18–20.
6. *Summary of the 2018 National Defense Strategy of the United States of America: Sharpening the American Military's Competitive Advantage* (Washington, DC: Department of Defense, 2018).

7. *Force Design 2030* (Washington, DC: Headquarters Marine Corps, 2020), 4.
8. *Education for Seapower Strategy, 2020* (Washington, DC: Department of the Navy, 2020), 3.
9. *Education for Seapower Strategy*, 12.
10. Matt Gonzales, "Marine Corps to Build Innovative Wargaming Center," Marines.mil, 25 August 2020; and "Wargaming Director, Krulak Center," Landing, 19 March 2021. The wargaming center is designed as a 100,000-square-foot facility that will house more than a dozen wargames each year, including two large-scale, 250-person exercises, and simulations that will offer a realistic representation of future operating environments. Its mission is to enable users to identify issues, consider objectives, and scope and analyze the problems, resulting in data and analytics to inform decisions that affect force development, force management, system functionality, and Service functionality. According to the posted wargaming director job description, this position "will advance Marine Corps warfighting excellence through the employment of wargaming methodologies within an academic institution delivering world class education to military and government professionals. The incumbent will serve as the Director of Wargaming, located at the Krulak Center, and is responsible for identifying requirements and resources, providing input to and assisting faculty development, and devising innovative approaches to employing wargaming through all levels of the Marine Corps Professional Military Education (PME) system."
11. *Marine Corps University Updated Strategic Plan, 2017–2022* (Quantico, VA: Marine Corps University, 2018). The updated strategic plan for the university is being crafted by a working group and is due for release in 2022.

"Napoleon at Waterloo"
The Events of 18 June 1815 Analyzed via Historical Simulation

Charles J. Esdaile, PhD

Abstract: The Battle of Waterloo is one of the most memorable actions in world history and has in consequence given rise to both an enormous historiography and many other forms of commemoration. "Napoleon at Waterloo" examines one such form of commemoration, namely the traditional board wargame, and it examines how this activity can be employed to further understand how the battle was fought and won.

Keywords: Battle of Waterloo, Napoleonic Wars, Napoleon Bonaparte, wargaming, historical simulation

Introduction

The Battle of Waterloo is beyond doubt one of the most intensely studied battles in all history. Within days of the guns falling silent on the appalling charnel house to which the battlefield had been reduced, accounts of the struggle had started to appear in print while the very night of 18 June 1815 had seen the victorious Duke of Wellington write a report of the events of the day for the government in London. These early efforts to tell the story were but the first in a torrent that has continued all but unabated to this day, a deluge to which the author of this article has himself contributed via a walking guide to the battlefield and a counterfactual discussion of what might have happened

Until his retirement in 2020, Dr. Charles J. Esdaile held a personal chair in the Department of History at the University of Liverpool. A specialist on the Napoleonic era, he is the author of many books on the subject including both general studies, e.g., *Napoleon's Wars: An International History, 1803–1815* (2007) and monographs, e.g., *The Spanish Army in the Peninsular War* (1988); *Fighting Napoleon: Guerrillas, Bandits and Adventurers in Spain, 1808–1814* (2004); and *Women in the Peninsular War* (2014). Among his most recent publications is a guide to the battlefield of Waterloo, *Walking Waterloo: A Guide* (2019).

had Napoleon Bonaparte succeeded in defeating Wellington and his Prussian counterpart, Field Marshal Gebhard von Blücher.[1] In this work, impossible to ignore though it is, the primary aim will not be to retell the military history of the campaign of the Hundred Days yet again: around 20 such narratives were published in the course of the bicentenary in 2015, and there is little if any genuine originality that the current author could add to them. How Waterloo has been remembered is another matter, however: very few scholars have sought to look at this subject, while those that have been inclined to think in terms of more-or-less conventional subjects such as monuments, public commemorations, films, and works of art and literature. Most members of the wider public are likely to encounter Waterloo primarily through phenomena of this sort, but there is another field that could be considered as being ripe for discussion, namely the historical conflict-based board game. There are at least 25 products portraying either the full campaign of the Hundred Days or the climactic battle of 18 June 1815 that have appeared since the foundational moment represented by the establishment of the renowned Avalon Hill company in 1952. Considerations of space making it impossible to mount a full analysis of the subject, no attempt will be made to do so here.[2] Instead, the object of this article will rather be to examine one way in which the products of the game industry can be used to probe the course of events and draw out wider lessons relating to the conduct of war or, to put it more explicitly still, to show how historical board games are not just recreational artifacts but also a tool with which more fully to explore, analyze, and understand campaign design and battle execution. In this instance, the focus will be the campaign of the Hundred Days and the culminating Battle of Waterloo, but it will be understood that the same methodology can be applied to any one of the myriad conflicts with respect to which it is possible to purchase board games of one sort or another.[3]

Let us begin with a pair of definitions. In brief, the sort of products under discussion in this article offer two methods of approach. Both rely on the same foundation, namely the provision of systems whereby the manner in which war is conducted in a given historical period at the level of the tactical, the operational, or the strategic can be reproduced on the tabletop and the participants confronted with a series of problems whose resolution depends on the application of force as mediated by the mechanisms concerned. At the same time, both offer significant aids in respect of the learning process—there is, then, no suggestion that one is superior to the other—while both depend on an accurate depiction of the terrain. That said, they are very different. Thus, on the one hand, there is the wargame, namely a contest in which the belligerent parties can both engage with a significant hope of victory—a condition that is often satisfied by allowing for the possibility of significant changes in the course of

events (in the case of Waterloo, obvious examples include the appearance on the field of French Marshal Emmanuel de Grouchy's command and the nonappearance of that of Blücher)—and are free, if not to move away from the historical deployment of their forces, then at the very least to employ alternative strategies in pursuit of the desired aim of the defeat of the enemy. As one authority notes, this can be a very rewarding activity. Thus, "By playing with the variables of tactics and strategy, reinforcement and supply and timing and preparation, [the historian-gamer] can gain a unique insight into the crucial factors of an engagement . . . why the actual results of a battle or war came about and how they might have been altered."[4] Yet, there is an obvious drawback in that the games concerned can become excursions into the world of fantasy or, still worse, exercises in wish fulfillment. If what is sought is realism, then, what is needed is rather the second approach on offer, namely that of historical simulation, this last being definable at the most basic level as the attempt to reproduce and work through certain given combat situations in accordance with the decisions taken by the actual commanders with respect to such matters as deployment and grand tactics. As will become clear, it is this latter course of action that has been adopted in this article, although the product on which the analysis is based is also one that is ideal for wargaming Waterloo, the purpose, indeed, for which it was originally designed.[5]

Finally, why the choice of Waterloo? One possible answer to this question is simply that the component parts needed for a simple wargame and/or simulation are, as we shall see, freely available from the internet, but, as true as this is, the events of 18 June 1815 are also such as cannot but fire the imagination: setting aside the fact that it was the one occasion when the two greatest commanders of the age faced one another on the proverbial "stricken field," the situation that had emerged was for both sides a desperate race against time. Meanwhile, Wellington, Blücher, and Napoleon were all at the head of armies that were in different ways desperately frail, the ranks of both the Anglo-Dutch and the Prussians containing far too many raw recruits and unwilling militiamen, and those of the French riven with doubt and suspicion, just as all three found themselves confronting difficult strategic choices. And, finally, there are, too, the numerous generic military problems with which the game provides insights, whether it is the importance of combined-arms tactics; the difficulties inherent in coalition management; or the best way to conduct a static defense, organize a full-scale attack, or feed troops into a major battle from afar, not to mention the way in which the defeat of Napoleon came to stand for the notion of the possibility of both fighting and ending a major war between the European powers in a matter of days, a belief that was to have a pernicious effect on the international relations of 1914. Add to all this the fact that, if far from totally

unspoiled, the battlefield is not so very different from the state it was in at the time that the battle occurred, and one can see many reasons why Waterloo is an obvious subject for discussion.

Historical Context

It has been stated that the purpose of this article is not to provide yet another narrative account of the Battle of Waterloo. That said, the author's purposes will not be served unless some insight is provided into understanding the battle, and all the more so given the fact that this last differs considerably from the "received" version of events, which has tended to dominate the literature, as exemplified, for example, by the works of the preeminent Napoleonic historian, David G. Chandler. First of all, however, a few words may be in order with respect to the brief campaign by which the titanic conflict of 18 June was preceded. In brief, having escaped from exile on the island of Elba, Napoleon once again seized power in France, only to be confronted by the military might of virtually the whole of Europe. Anxious to win an early victory that might shatter the resolution of his opponents and possibly even win the war at a stroke, the emperor decided to attack the enemy forces that lay nearest the frontiers of France, namely the Anglo-Dutch army of the Duke of Wellington and the Prussian one of Field Marshal Gebhard von Blücher, both of which were stationed in Belgium. Adopting a central position designed to split its foes in twain and expose them to defeat in detail, the French crossed the border on 15 June and succeeded in winning a substantial victory over the Prussians at Ligny, Belgium, the next day. That said, already the campaign was falling into disarray: not only had large parts of the army been very slow to get moving, but the chance of both a far bigger victory at Ligny and a defeat of Wellington's forces at Quatre Bras, Belgium, was lost due to poor staff work. Far from being driven asunder, then, on 17 June the two allied armies were able to retire in good order to mutually supportive positions a few kilometers south of Brussels at Wavre in the case of the Prussians and a dominant ridge known as Mont-Saint-Jean, leaving Napoleon and Grouchy—the commander he had sent to pursue the Prussians—groping blindly in their rear in the midst of a torrential thunderstorm that inundated the countryside and slowed progress to a crawl.[6]

What of the topography that was shortly to be the scene of such carnage? In the same way as many aspects of the battle, this has been much misrepresented.[7] Thus, the battlefield of Waterloo is commonly envisaged as a simple matter of two parallel ridges with a shallow valley in between. Rather what one has is a rolling upland pitted with a variety of dips, valleys, and indentations, with all the high ground being pretty much of a similar elevation. Having emerged from the forest of Soignies and passing through Waterloo, where Wellington had his headquarters, the Brussels-Charleroi highway rose gradually for the

3 kilometers (km) that it took to reach the battlefield. After perhaps three-quarters of the distance at a small hamlet known as Mont-Saint-Jean, a second highway branched off to the southwest in the direction of Nivelles, whereupon the Charleroi highway ascended a steep slope culminating in a long east-west ridge: known, like both the hamlet and the substantial walled farm halfway up the hill, as Mont-Saint-Jean, it was this that provided Wellington with his main fighting position, and here, too, that the upland mentioned previously begins. At the crest, the highway was crossed at 90 degrees by a lane stretching left and right, the junction being marked by a solitary elm tree. To the east, this lane, which ran from the town of Braine-l'Alleud 3 km to the northwest to the village of Ohain 3 km to the west, was lined on both sides by thorn hedges, but to the west the ground was completely open. In the immediate vicinity of the crossroads, both the Charleroi highway and the Ohain road were deeply sunken, the banks rising to as much as 10 feet on either side, while the forward slope of the ridge to the west of the highway was broken by a prominent knoll, immediately beneath which there was a shallow quarry.[8]

Insofar as the ground was concerned, to the east the battlefield was much as it has generally been portrayed: across a shallow valley perhaps a kilometer across, a second ridge ran from east to west more-or-less parallel to Wellington's position. However, several hundred yards to the west, rising a little as it did so, a broad ridge jutted out diagonally in the direction of the French lines, which it reached in the vicinity of the spot where they were crossed by the Charleroi highway; an important local watershed, this cut the battlefield completely in two and rendered it quite impossible for troops posted to the east of the highway to see what was going on to the west and vice versa. To the right of this feature, there was a deep hollow, which after about a kilometer it opened out into a broad north-south valley through which ran the dead-straight Nivelles highway, said hollow being crossed diagonally at its eastern end by a lane that ran in a roughly southeasterly direction from the Ohain road and joined the Charleroi highway just a little short of the spot where it reached the French ridge, this last being much more prominent to the east of the highway than it was to the west.

Even this passage does not exhaust the complications offered by the battlefield. As the Charleroi highway rose toward the French positions, then, it passed through a deep cutting occasioned by the presence of a significant swell in the ground (referred to in this work as the intermediate ridge) that ran parallel with the French position for much of its length, and was separated from it on both sides of the watershed mentioned above by a shallow valley. Behind the French right, meanwhile, there was a much deeper depression and then a ridge that connected the upland crossed by the Charleroi highway with a further mass of high ground known as the heights of Agiers, this last feature thrusting a pronounced shoulder southward that all but merged with the ridge that marked

the French front line and hid a deep reentrant that angled sharply back uphill from the valley beneath Wellington's extreme left flank and was home to the hamlet of Smohain (today La Marache).

From Smohain, a lane ran southward up the side of the reentrant and at the top of the slope this crossed what was to turn out to be the most important channel of communications on the battlefield, namely a country road that led westward from Wavre to Braine-l'Alleud. Having crossed a small river some distance to the west at the village of Lasne, this ascended the heights of Agiers via a thick wood called the Bois de Paris, and then ran due west along the ridge parallel to the rear of the French front line to a spot above a second and far more substantial village called Plancenoit situated in a deep valley to the left, at which point it turned sharply to the south and ran uphill to the high ground crossed by the Charleroi highway, where it turned sharply to the west once more and, crossing the highway, dropped down into the dip behind the intermediate ridge from whence it followed a generally northwesterly course in the direction of the Nivelles road and, beyond it, Braine-l'Alleud. To the left of this last stretch, the ground was undulating, with the most important feature being a pronounced eminence just beside the Charleroi highway, but it generally sloped upward to a further area of high ground that marked the southern edge of the upland on which the battle was fought.

With the exception of the need to note that, except for the Bois de Paris, patches of woodland on either side of the Wavre-Braine-l'Alleud road at the western end of the ridge above Plancenoit and various features at Hougoumont and La Haye Sainte (see below), the battlefield was almost treeless and, further, that it was mostly given over to the cultivation of cereal crops grown in broad, open fields, there is little more that needs to be said about the physical geography. As for the human geography, this was limited. Setting aside the two villages and the farm of Mont-Saint-Jean, on the French side of the battlefield the course of the highway was marked successively by two wayside taverns, of which the first was known as La Belle Alliance and the second owned by a man named De Coster and, a kilometer to the south near the farther edge of the upland, a house called Rossomme. In the rear of the French left beside the Nivelles road was a large country house called Mon Plaisir and, more or less opposite it at the other extreme of the battlefield on the slopes overlooking Smohain, the château of Frischermont. However, the most important buildings on the battlefield by far were the four complexes that dotted the forward slope of Wellington's position, from east to west these being the farms of La Haye, Papelotte, and La Haye Sainte and the chateau of Hougoumont.

Beginning with the first two, these stood side by side a few hundred yards from Smohain, though La Haye was a mere cluster of buildings while Papelotte was a stoutly built courtyard farm. Another courtyard farm, screened to its

south by a small orchard, La Haye Sainte constituted a compact rectangle built on a north-south axis immediately beside the Charleroi highway perhaps 250 yards south of the crossroads. And, finally, situated deep in the hollow beneath the watershed in advance of Wellington's right flank, Hougoumont was a much larger affair than any of the rest, comprising the château (a three-story building surrounded by a series of barns, stables, and store sheds); a large, formal garden protected on its southern and eastern sides by a high wall; a kitchen garden; an orchard; a paddock; and a large wood that stretched southward all the way to the summit of the intermediate ridge. Much of the perimeter was surrounded by a dense hedge and ditch, while a farther hedge separated the orchard from the paddock.

Hougoumont was linked to the Ohain road by a lane lined with a row of poplars, while other lanes besides the ones already mentioned crisscrossed the battlefield in various directions (e.g., from Hougoumont to La Belle Alliance; from Papelotte to La Belle-Alliance; from Smohain to Plancenoit; from Plancenoit to the Charleroi highway; and from Rossomme to the Nivelles road), but, though occasionally deeply sunken, particularly in the vicinity of Papelotte, they were to play little role in the battle. With the exception of the Charleroi highway and the Nivelles road, all the roads were mere country lanes with no paving of any sort, the heavy rain therefore causing muddy conditions even before the fighting began. Indeed, with the whole of the battlefield composed of a thick clay soil, the going was everywhere at best heavy and, in places, completely impossible.

With the scene duly set, let us proceed to a narrative of the battle. Although the rain stopped at first light, dawn on 18 June 1815 was a damp and miserable affair, while many of the French troops had yet even to reach the field. For a short time then, there was no chance of anything happening, and it was not in fact until about 1130 that the battle began. In consequence, the army of the Netherlands was able to deploy without the slightest haste, its order of battle showing the British general's mind all too clearly. Thus, believing that the Prussians would arrive very quickly, Wellington left his left flank but thinly held: from the crossroads to Smohain, there were the equivalent of a mere six brigades of infantry, of which only two were British, and three brigades of cavalry; still worse, several of the units concerned, especially the British brigade of Major General Denis Pack and the Dutch one of Major General Willem van Bijlandt, had suffered very heavy casualties at Quatre Bras, while two others were composed entirely of low-grade Hanoverian militia. By contrast, from the crossroads to the Nivelle road, there were six infantry brigades, of which four were either British or King's German Legion, and seven cavalry brigades, and from the Nivelles road to Braine-l'Alleud seven infantry brigades, of which three were either British or King's German Legion, most of the troops in this last section of

the line being held well back so as in effect to create a refused flank. Obviously enough, then, it was felt that the real danger rather lay in the relatively open ground in front of Braine-l'Alleud, Wellington being so concerned about his right that he posted a further 10,500 troops well to the west at Hal in case the emperor should try a wide outflanking movement. Quite why he should have thought this was a possibility, however, it is hard to see, for, even if successful, an attack on his right flank would only have driven him toward the Prussians, this being precisely the object that Napoleon was least likely to desire.[9]

In assessing Waterloo, Wellington's many admirers have made much of the strength of the position that he adopted. This last was certainly far from bad, but nor was it impregnable. If the ridge certainly offered protection from artillery fire, not to mention complete concealment, in very few places were its slopes a serious obstacle to movement, while Hougoumont, La Haye Sainte, and Papelotte-La Haye were of less use than is sometimes suggested. Best of all was probably the often-neglected Papelotte-La Haye as this offered its defenders an excellent field of fire in all directions, but the value of the others were more dubious. Situated in a deep hollow and almost entirely masked by trees, Hougoumont was near useless unless troops could hold the outer perimeter, while the layout of La Haye Sainte was very inconvenient in that troops trying to defend the orchard at its southern end could neither retire nor be reinforced with any ease for want of any gate or door in the southern wall. Still worse, there were few apertures in the walls on either side; the outer door of the main barn had been taken for firewood; and, unlike at Hougoumont (see below), nothing had been done to prepare the buildings for defense. On the bright side, neither position was especially helpful to troops attacking the ridge as they offered no view of the defenders' positions and could easily be pounded by artillery should they be taken; but the keys to victory they most certainly were not, the real importance of both La Haye Sainte and Hougoumont being simply that they denied the French the space they needed for the combined operations that were their best chance of breaking Wellington's line and then only in a sector that was far from uppermost in Napoleon's thoughts.[10]

Contrary to Wellington's expectation, in fact, the emperor was not initially planning to attack his right wing at all: believe that the Prussians were out of the fight though he might, he did not wish to do anything that would increase the chances of the British commander linking up with Blücher. As his troops came up, they were arrayed in a convex line stretching from beyond the Nivelles road to the slopes opposite Papelotte, and in this matter placed so as to threaten the whole length of their opponents' position—in brief, the three divisions of Marshal Honoré Charles Reille's II Corps held the sector from the Nivelles Road to La Belle Alliance and the four of Marshal Jean-Baptiste Drouet's I Corps that from La Belle Alliance to Papelotte with their respective light cavalry divisions

on their outer flanks, while each one of them was backed by three divisions of cavalry and, farther back still, the three divisions of guard infantry.[11] Due to form a further reserve in the rear of the right wing were Marshal George Mouton's severely understrength VI Corps, one division of which had ended up with Grouchy, and two stray cavalry divisions that had become detached from the latter's forces, though none of these troops were as yet anywhere near the battlefield: badly delayed by the rain, they were not to appear until the early afternoon.[12] In charge of the troops in the first line—those of Drouet and Reille—was Marshal Michel Ney, who appears to have occupied the role of a senior executive officer, but all the rest of the army was kept firmly under the control of the emperor.[13]

At first sight, the sheer symmetry of the French Army of the North's initial disposition might suggest that what was intended was a head-on attack, and the emperor did in fact later claim that this was his aim. If such was the impression that was aimed at, however, in reality it was a trick designed to obscure Napoleon's real intentions. Thus, abjuring the cluttered terrain to the west in favor of the open hillsides to the east, the emperor planned to launch a massive attack on Wellington's left with I Corps—it was no mistake that this was both the largest and the freshest of his formations—while keeping back the guard, VI Corps, and most of his cavalry for the final coup de grâce.[14] With the benefit of hindsight, of course, it can be argued that an attack on Wellington's left was foolhardy indeed, as it effectively meant that a good half of the French Army would in effect be marching into a trap, but it cannot be emphasized strongly enough that on the morning of 18 June, the emperor did not have the slightest reason to believe that Blücher was coming. That there was a force of Prussians at Wavre he knew full well, Grouchy having told him as much the previous evening, but in a note penned at 0600 the latter insisted that, if the whole Prussian army was at Wavre rather than the mere 10,000 he had at first placed them at, there was no need to worry as they were withdrawing on Brussels.[15]

Setting aside a few shots that rang out when some French cavalry chased off a few German infantry who had been sent to garrison Smohain and Frischermont, it was not on the eastern half of the battlefield that the battle began, however. On the contrary, realizing that his great right hook needed to be secured against a spoiling attack, having had two batteries of 12-pounder guns subject Wellington's center to a preliminary barrage, Napoleon sent orders for Reille to dispatch some troops to occupy the extensive wood in his front.[16] This was, of course, the same wood that masked Hougoumont, but the fact that it concealed a strong and well-garrisoned fortified post—unlike at La Haye Sainte, the 1,300-strong garrison, almost all at this point either Hanoverians or Nassauers, had had time to build firing steps, barricade some of the gates, and knock extra loopholes in the walls—was lost on Napoleon, for the buildings were entirely

invisible to him. This should have made no difference for, to carry out their orders, Reille's men needed only to seize the wood and the orchard, but in command of the attackers was Napoleon's younger brother, Jérôme Bonaparte. A headstrong and foolish individual who was ever out for glory, having almost literally bumped into the château, he resolved on its capture at all costs, and the result was a prolonged struggle that negated the position's value as a firebase and pulled in the bulk of a particularly valuable British guards brigade, but at the same time came permanently to absorb fully one-half of Reille's corps.[17]

The struggle for Hougoumont was marked by many famous incidents of which the most well-known is the episode in which a large party of French troops burst in through the north gate, only to be cut down almost to the last man when the gate was forced shut behind them. In the end, however, horrific though it was—many of the buildings caught fire with the loss of many wounded who had been sheltering inside—the fight was but a side issue. Far more crucial were events farther east. Here, Napoleon's aim, as we have seen, was to crush Wellington's left. Available for the assault were the four infantry divisions of Drouet's I Corps, namely those of Joachim-Jerome Quiot, François Xavier Donzelot, Pierre-Louis Binet Marcognet, and Pierre-François-Joseph Durutte, but before they were sent forward a sustained attempt was made to soften up the defenders with the two heavy artillery batteries attached to I and II Corps. Together composed of 12 12-pounder guns and 4 heavy howitzers, these pounded the area around the crossroads from La Belle Alliance for more than an hour, but, unbeknownst to the French, they inflicted little damage: not only did many of the projectiles simply bury themselves in the waterlogged ground but the infantry had been ordered to lie down and the cavalry to dismount. Casualties, then, were limited, but this did not mean that the assault was not a major threat. On their left flank, the assault forces—some 20,000 men—were supported by a brigade of cuirassiers (mounted soldiers with breastplate armor), while the two divisions in the center of the array—those of François Donzelot and Pierre Binet de Marcognet—were drawn up in an unusual formation that saw the eight battalions of which they were each composed drawn up in line one behind the other, the idea being that they could match the firepower of any troops who confronted them while also maintaining the maneuverability of a column (on either side, by contrast, the divisions of Joachim Quiot and Pierre Durutte appear to have been deployed in standard brigade or battalion columns of a much more flexible nature).[18]

Drouet's assault, then, was by no means just a matter of brute force. Nor did the careful thought that went into it go unrewarded. First to feel the weight of the assault were the defenders of La Haye Sainte, the rifle-armed 2d Light Battalion of the King's German Legion commanded by Major Georg Baring. Overwhelmed by the enemy skirmishers, the soldiers whom Baring had placed

to hold the orchard were forced to flee into the open fields to the west where they were succored by a Hanoverian infantry battalion that had been sent down from the ridge above to cover their retreat. This last decision, however, proved a grievous error: to their horror, the riflemen and Hanoverians suddenly found themselves assailed by the cuirassier brigade. Being closer to the farm, most of Baring's men managed to make it back inside, but the Hanoverians were completely routed and effectively ceased to exist as a fighting unit. Still worse, a King's German Legion battalion sent forward to cover their retreat (the 8th Line) was also caught by the French cavalry and driven back with the loss of a color. On the other side of the farm, meanwhile, things were just as bad: if the troops of Quiot's division were unable to break into the buildings, they did overrun the knoll and quarry a little farther up the highroad, the defenders of which—several companies of the first battalion of the famous 95th Rifles—fled in disorder, while the sudden appearance of cuirassiers on the slopes above La Haye Sainte caused a panic that saw the whole battalion fall back to the rear. Only once they had breasted the knoll and reached the sunken Ohain road did Quiot's men experience any check. Setting aside the 95th Rifles, the front line of the defenders was composed of the Dutch brigade of Willem van Bylandt. Having suffered very heavy casualties at Quatre Bras, the troops concerned were in no condition to resist an assault by four French divisions and, after a brief fight, they too turned and fled. Behind them, however, were the two veteran British infantry brigades of Sir James Kempt and Sir Denis Pack and, notwithstanding the terrible losses they too had endured at Quatre Bras, these immediately launched a counterattack. On the right, under the personal direction of their divisional commander, Sir Thomas Picton, Kempt's three remaining battalions (the 95th Rifles appears not yet to have rallied from its earlier disorder) scored an immediate success in that, suddenly leaping up from behind the crest of the ridge, they checked Quiot's division with a single volley followed by a bayonet charge. That said, Picton was shot dead, while, to the left, Pack's brigade had been less fortunate. Thus, advancing to attack Marcognet's division, it was thrown back by a massive volley and completely checked.[19]

For a moment, then, it looked as if the French had broken through, but there now followed one of the most dramatic episodes in the battle. Behind Picton's troops was the heavy cavalry brigade of Sir William Ponsonby while across the Charleroi highway in a similar position was that of Sir Edward Somerset (by chance composed of one English, one Irish, and one Scottish regiment, the former quickly nicknamed itself "the Union Brigade," just as the fact that the latter was largely drawn from the Life Guards and Royal Horseguards gained it the sobriquet of the "Household Brigade"). Apparently at the personal initiative of the commander of the British cavalry, Lord Uxbridge, these two brigades launched a dramatic charge that took them through the crumbling allied front

line and into the oncoming enemy. Initially, success was complete: taken by surprise, the French recoiled in disorder and in many instances turned to flee altogether, the spoils of the victorious cavalry including two eagles and perhaps 3,000 prisoners. However, drunk on glory, the two British brigades now got out of control, galloping down into the low ground below Wellington's position, and in some instances even getting up onto the intermediate ridge where they rode down a number of I Corps' divisional batteries, these last having advanced to occupy the obvious position that it offered.[20] The result was disaster: French cavalry under Charles Jacquinot and Jacques Delort moved against the milling horsemen from east and west alike, and slaughtered them in great numbers, less than half their number eventually making it back to their original positions and many of them only doing so at all thanks to a timely charge on the part of the British light-cavalry brigade of Sir John Vandeleur near Papelotte.[21]

The survivors of the brigades of Ponsonby (himself among the dead) and Somerset were for the time being out of the battle, but through their actions they had thwarted what was probably Napoleon's best chance of victory. Nevertheless, the emperor was far from finished. On the right, Durutte's division had not been much affected by Uxbridge's counterattack, and had therefore continued to press forward, thereby inaugurating what became a long and bitter battle for La Haye and Papelotte. Entirely composed of Dutch and Germans who had lost many men at Quatre Bras, the defenders were pressed ever backward and were eventually driven from La Haye altogether, the French ruler therefore resolving to exploit their success by sending in the VI Corps of Georges Mouton, which had hitherto been sitting out the battle far to the rear in the vicinity of Rossomme, the idea being that this would push down through the valley in which Smohain was situated and swing round the allied left flank. Also given the support of the two cavalry divisions detached from Grouchy's command, such a move seemed to promise every success, but until it could be brought to fruition there was a major problem in that much of Napoleon's front line was in complete disarray: on the left Reille continued to be bogged down at Hougoumont, while on the right the three divisions caught by the British cavalry were still badly shaken. It is in this context that what happened next has to be understood. In brief, virtually all the available cavalry were flung into an assault on Wellington's right-center. According to the traditional version, this was the result of a Ney mistakenly convinced that the Anglo-Portuguese forces were retreating, but all the evidence suggests that the author of what happened was rather Napoleon. Given the emperor's determination to shift all the blame for his misfortunes elsewhere, we can only speculate as to why he acted as he did, but the most probable explanation is that he was concerned that, with much of his army shaken and off-balance, there was a serious danger that his opponent might launch a general assault. As massed cavalry charges had proved a very

effective way of staving off disaster in several of his earlier battles, most notably Eylau and Aspern-Essling, the remedy was obvious, and thus it was that, while as many French guns as possible continued to pound the allied line, at about 1600 the first of the 9,000 troops concerned moved forward along the axis of the watershed ridge, some of them also spilling over into the hollow that separated it from Hougoumont.[22]

There followed extraordinary scenes. Advancing on Wellington's line at a pace no better than a lumbering trot (the ground was far too waterlogged for anything else), the cuirassiers of Edouard Milhaud and François Kellermann, not to mention the two divisions of cavalry belonging to the Imperial Guard, crowded into the narrow front offered by the gap between La Haye Sainte and Hougoumont under a hail of artillery fire. Reaching the crest, they overran most of the batteries that lined it, but then hit an insuperable obstacle. Thus, all the way from Hougoumont to the Charleroi highway, the allied infantry had been deployed in two lines of squares. So long as the defenders held their nerve, such formations were impervious to cavalry, and the result was that the horsemen milled about them in confusion while at the same time suffering heavy losses to musketry. Nor was this an end to their travails, for the squares were backed by numerous regiments of British and Dutch cavalry, and these countercharged the discomforted French horse and drove them back over the crest, only immediately to gallop back to their original positions to reform. For the next two hours, the same process was repeated over and over again with the increasingly desperate French cavalry losing heavy casualties each time they returned to the charge and achieving almost nothing in return for their efforts. That said, the defenders did not go unpunished: forced to remain in square and in some cases deprived of the shelter of the ridge (the worst sufferers here were Frederick Adam's brigade, this last having been deployed in the open fields to the east of Hougoumont in an effort to safeguard communications with the château), in between the French charges they suffered very badly from artillery fire. Had a mass of infantry been available to follow up the cavalry attacks, then, something more might have been obtained, but when the division and a half of Reille's corps that were the only troops available in the sector for such a task were finally ordered forward, they were flung back with enormous losses (a particularly interesting point to note here is that, despite the presence nearby of thousands of French horsemen, the troops concerned received no support from them whatsoever, this being yet further evidence of the failure of Napoleon to coordinate the activities of his forces).[23]

At this point in the battle, Napoleon still possessed substantial reserves in the form of the three divisions of infantry belonging to the Imperial Guard. That they were not forthcoming brings us to a dramatic development in the narrative. As we have seen, during the night Wellington had received assurances

from Blücher that he would march to his assistance with his entire army at first light. Completely unmolested by Grouchy, who was still many kilometers to the south, the Prussian commander proceeded to do just this, but a variety of issues, including, not least, the terrible state of the only roads available, slowed his rate of march dramatically, and it was therefore well past 1600 before the first Prussian troops reached even the Bois de Paris. However, contrary to all the usual accounts of the battle—completely erroneously, it is almost universally claimed that Napoleon spotted Prussian troops in the far distance as early as 1300 and, further, that a captured Prussian hussar was soon after brought to his command post for interrogation—the French were completely unaware of their presence, the fact that Mouton's corps was on hand to deal with the new arrivals being pure happenstance.[24]

In consequence, when Prussian forces—the advanced guard of Friedrich von Bülow's IV Corps—suddenly emerged from the Bois de Paris at about 1630, it came as a complete shock, so much so, indeed, that Napoleon initially put the firing that suddenly erupted on his extreme right down to an accidental clash between Grouchy's men and those of Mouton. In the circumstances, then, the latter did extremely well in that they managed to form a solid defensive line between the woods flanking the road from Lasne to Braine-l'Alleud, while the various units of light cavalry that had been attached to them launched a series of charges designed to slow down the progress of the enemy. However, tough and determined though Mouton was, he could not hope to prevail against the ever-greater numbers by which he was faced and, with substantial Prussian forces beginning to push through the low ground to his right, he was forced to conduct a fighting retreat that eventually took him to a position running north from Plancenoit. Securing this last place with one of his four infantry brigades, he then turned at bay, but the Prussians soon drove his men from the outskirts of the village, thereby creating a real crisis: were Plancenoit to fall, the whole French position would become untenable. It was this fresh danger that prevented Napoleon from making any use of the sacrifice of so many of his cavalry, for, rather than sending it to attack Wellington, he was forced to use the whole of the Young Guard to drive back the Prussians. This they did with aplomb, but, having once advanced into Plancenoit, they could not be withdrawn, Bülow's men showing not the slightest sign of slackening the pressure.[25]

If help was at last at hand, the army of the Netherlands was barely aware that this was the case: situated in a deep hollow as it was, Plancenoit was all but invisible from Mont-Saint-Jean. Indeed, the situation of Wellington's forces now deteriorated dramatically. Having personally taken part in the cavalry charges, following receipt of fresh instructions from Napoleon, Ney now organized a fresh assault on La Haye Sainte. Unfortunately, successively reinforced though it may have been, the garrison was running short of ammunition, and

in consequence, it was soon overwhelmed. Much encouraged, the troops who had driven them out pressed forward to the crest of the ridge and assailed the defenders with heavy fire, while they also for a second time gained the knoll held by the 95th Rifles and in addition brought up a number of guns, including some that they stationed on the highest point of the watershed in a position in which they could wreak terrible damage on the defenders. Frantic to redeem the situation, the inexperienced Prince of Orange ordered Christian von Ompteda's King's German Legion infantry brigade to retake La Haye Sainte, but only one battalion—the 5th Line—was still in a state to fight, and this was immediately cut down by a force of cuirassiers that had gone unperceived in the thick smoke that now cloaked the whole battlefield, Ompteda being killed by French infantry in the farm's kitchen garden. In short, Wellington's army was in serious difficulties, but the decisive blow that might have settled the issue never came, for, when an exultant Ney sent to Napoleon for fresh troops, the emperor refused point-blank to send him any, and that despite the fact that he still had two divisions of guard infantry within a few yards of his position at La Belle Alliance (for much of the day, he had remained far in the rear at his command post overlooking the farmhouse of Rossomme, but at some point in the afternoon he had come forward to observe the progress of the battle firsthand).[26]

The decision not to send in the guard at this point was fatal, for a concentrated blow might well have broken through and forced Wellington to withdraw. Yet, once again, Napoleon appears to have lost his nerve, backing away from the final gamble that was his only hope of obtaining even a marginal victory (that it would be no more than this was guaranteed by the fact that his cavalry were no longer in any state to pursue Wellington). Instead, he became bogged down in organizing a counterattack by a mere two battalions at Plancenoit, and it was not until another hour had passed that he finally relented and released a part of the guard to follow up Ney's success. By now, however, it was almost certainly too late, for Wellington had rushed in his last reserve—the Dutch division commanded by David Hendrik Chassé previously stationed at Braine-l'Alleud—to shore up his center. Still worse, only 10 battalions of the 15 that might have been employed in the attack actually took part in it, while even they lost their cohesion as they advanced across the muddy and much-encumbered ground, and therefore struck Wellington's line at three different paces and anything but in unison. Supported by the troops who had seized La Haye Sainte and led by Ney, the right-hand-most elements of the attack succeeded in driving back or putting to flight altogether a number of units that had been hard hit in the course of the day, but even they were thrown back by the fresh troops of Chassé, while the rest of the assault force did not even achieve that much in the way of success, but it was routed by a classic British combination of volleys and bayonet charges, the coup de grâce being delivered

by the 52d Foot, which wheeled forward from its position on the ridge and took the last French troops still in the fight in the flank. Seeing his advantage, Wellington immediately ordered the right wing of his army to advance and large numbers of troops therefore swept forward toward La Belle Alliance. Their spirit utterly broken at the sight of the guard fleeing in panic, all the French troops in the area broke and ran, the only resistance of any sort being put up by three battalions of the guard that had unaccountably been left in the rear.[27]

According to British accounts, it was the guard's defeat that broke Napoleon's army. This, however, is only partially true. Due to the configuration of the ground, few of the French troops who were fighting to the east of the Charleroi highway had any view of the western half of the battlefield, and, if they turned and fled at virtually the same moment in time, it was for an entirely different reason. Thus, for hours many more Prussian troops had been pouring onto the battlefield, but the majority of these had been fed into the fight for Plancenoit. At length, however, a further force that had marched from Wavre by a different route, namely the corps commanded by Hans Joachim von Zeithen, reached Smohain, where it had been temporarily delayed by a firefight with some German troops who had managed to creep back into the village and mistook the blue-coated Prussians for fresh enemies. The noise of this fighting greatly cheered the French troops in the vicinity: not surprisingly, they assumed that Grouchy, who in fact had ignored the sound of the guns at Waterloo and continued to follow the orders that he had received to march on Wavre where he became engaged in a bitter battle with a Prussian rear guard, had come (indeed, desperate to spur his troops on to one last effort, Napoleon had spread the idea that Grouchy had come across the entire battlefield). All too soon, however, their delight soon turned to dismay: at almost exactly the same time that the guard was being routed at the other end of the line, Zeithen's men launched a massive attack that immediately broke Durutte's division and soon saw thousands of infantry and cavalry heading for La Belle Alliance.[28]

Given that Plancenoit finally fell at around the same time, all was now lost for Napoleon, who, after a short delay, left the battlefield in his personal carriage. The few units of the Guard that were still intact or had at least managed to maintain their integrity tried to cover the retreat, but the army as a whole streamed southward in a state of complete panic. Meanwhile, despite the myth-making with which the battle has been surrounded, there was no heroic last stand: to purloin a famous phrase supposed to have been uttered by a senior officer of the guard as the rest of the army collapsed, the guard neither died nor surrendered, but rather was swept away in the flood.[29] So ended Waterloo. At a minimum of 18,000 for the allies and 24,000 for the French, casualties had been enormous. Yet, had it all been anything other than a glorious irrelevance? Probably not: even had Napoleon triumphed in the Waterloo campaign, there

would have been no change in the political situation, and it may therefore safely be assumed that the war would have gone on and that the allied superiority in numbers would have prevailed in the end. That said, Waterloo did ensure that the war came to an end with a minimum of bloodshed: there was some minor fighting as the allies closed in on Paris, but Napoleon had been so comprehensively beaten that he was left no choice but to abdicate, the provisional government that had taken over power in his stead thereupon promptly rushing to secure the best terms that it could. With the erstwhile emperor soon on his way to Saint Helena, truly it was the end of an era.

Simulating Waterloo

So much for the narrative. With this out of the way, we can now move on to the issue of simulation. As far as actions as big as Waterloo are concerned, the most effective way that such a project can be addressed is undoubtedly through the use of historical strategy games. Insofar as 18 June 1815 is concerned, there has always been a ready market for such offerings and, as we have seen, a considerable number have been produced over the years. In this article, however, we shall be concerned with just one game, namely an introductory product entitled *Napoleon at Waterloo* developed in 1970 by Simulations Publications Incorporated, or SPI. At first sight, what we have is a somewhat modest offering, the map measuring just 11 inches by 13, the rulebook extending to just four sides of A4, and the counters—most of them cavalry or infantry divisions—numbering no more than 61 (by contrast, other games on the same subject employ maps four or even six times as big, rulebooks that are four or even six times as long and counters that are four or even six times as many).[30] Yet, appearances are deceptive. Simple to play though it is, *Napoleon at Waterloo* is far from easy to play well. If they are to have a hope of winning, both sides having no option but to employ such sophisticated techniques as encirclement and diversionary attacks. In the words of one enthusiastic reviewer, "This is the triumph of minimalism over excessive detail, the wargame stripped back to its fundamentals."[31] Unusually, as already noted, the package has been made available as a free download on the internet and can also be played online, making it particularly suitable for use in the classroom or as a tool of analysis.[32]

If the basic mechanisms of the package deserve much praise, it is evident that one issue caused the designers problems that they found difficult to overcome. In brief, setting aside the Napoleon fetish that characterizes many of those who play wargames, and all the more so in the American market at which the products of SPI and other companies were primarily directed, a tendency that results in a desperate hankering to change history, the whole point of a game is that it offers an equal chance for both sides to win. However, in both respects, as it was actually fought, the Battle of Waterloo is difficult to conciliate

with these expectations, the fact being that, so incompetent was French staff work, so numerous the mistakes of Napoleon and, finally, so unfortunate the campaign in respect of the weather, that there was little or no chance of the emperor prevailing when he finally confronted Wellington at Mont-Saint-Jean. To quote one anonymous game designer:

> Frankly, I have never liked any games on [the Battle of] Waterloo. . . . In many ways, they seem pointless. All the important decisions have already been made in the campaign. By the time the battle starts, in many ways it is already won or lost. There is really nothing left to do but throw troops at each other and see who gets more lucky. There are not really any strategic options left.[33]

Not only will an accurate representation of the battle deliver a rather one-sided game, then, but there is also the question of hindsight. If there is one battle of the centuries prior to 1900 that all gamers will have a grasp of, it is Waterloo, and from this it follows that every tabletop Napoleon can expect that, at a time and place openly specified in the rules, the Prussian army will appear on the French right flank and engage it in battle. Faced by this threat, there are a number of responses, the two most obvious being either to seek to roll up Wellington's forces from the left in the hope of postponing contact with Blücher until the last possible minute and at the same time avoid being caught in a vice between the two enemy armies, or to hold back part of the army so as to be ready for the Prussian commander when he finally makes his appearance. Had Napoleon known that the Prussians were on the way, these were assuredly moves that the emperor might have made, but there is, alas, a major problem. Thus, as we have seen, contrary to almost every published account of the battle, in reality Napoleon had no knowledge whatsoever of Blücher's march from Wavre until Bülow's corps suddenly burst out of the woods beyond the extreme right wing of the Army of the North at around 1630 and crashed into the flank of Mouton's unsuspecting troops. All this being the case, players taking the part of Napoleon must necessarily be somehow prohibited from responding to the Prussian threat before it makes itself felt on the battlefield: otherwise, what we will have is a game that is very exciting, certainly, but which in no way resembles the events of 18 June 1815.

In other packages, an attempt is made to resolve at least part of the problem by banning the French from stationing any troops east of Papelotte, but this just causes fresh complications as it was precisely the area concerned that Mouton occupied following his belated arrival on the field in the early afternoon. At stake here is a fundamental question. In brief, is the object to produce a game that offers both players a sporting chance of victory and, at the same

time, if such is their desire, the ability to rewrite history in a manner more suited to their tastes, or is it rather to produce a simulation that rather forces them to act as if they were in the same position as Napoleon and Wellington? Both can be satisfactory exercises—a French commander who can triumph in the distinctly adverse circumstances in which Napoleon found himself in the morning of 18 June 1815 can feel pleased with himself indeed, while the same applies to an allied one who successfully holds off the French until the Prussians arrive—even useful exercises, and yet, to reiterate a point already made, they are not one and the same and should not be considered as such. Insofar as this article is concerned, it is the former case that will occupy us. Whether it is by delaying the arrival of the Prussians on the field, allowing Grouchy to march to Napoleon's aid, or starting the battle not at 1100 but rather two hours earlier, there are all sorts of ways in which the events of 18 June can be doctored to allow the French a greater chance of victory—in short, to create a game rather than a simulation—but, helpful as this may be in establishing what would have happened in the event of the introduction of this, that, or the other variable, it is of little use if what we are interested in is the situation that actually transpired.

Before going any further, however, let us first engage with the component parts of *Napoleon at Waterloo*. To begin with the map, this is extremely bland: while the main highways, the villages, and other buildings and the patches of woodland that dotted the battlefield are all shown, no attempt has been made to recreate the succession of ridges over which the battle was fought, the result being that there is no way of representing Wellington's famous use of the reversed slope to the rear of the high ground that marked his front line. That said, it could be argued that this crucial feature of his management of the battle is represented by the fact that for the most part the Anglo-Dutch infantry divisions have a larger number of combat factors than their French counterparts, ensuring that they will have a built-in advantage when subjected to attack (it could be argued, of course, that, should the Anglo-Dutch army leave the protection of Mont-Saint-Jean, they should immediately lose their advantage, but the need for this adjustment is lessened by the fact that, in the vast majority of games, they will not do this until the later stages of the battle and then only at a point when the French are on the brink of defeat). Something that might be seen as surprising is the manner in which the two Dutch-Belgian infantry divisions are shown as being only marginally inferior to their British counterparts—after all, British accounts of the battle generally treat the Dutch, Belgian, and German units under Wellington's command with great scorn—but, in fact, the decision is easy enough to justify, the forces contributed by the Kingdom of the Netherlands having on the whole performed quite creditably, and sometimes very creditably indeed (the performance of Chassé's division is the most obvious example, but a further instance may be found in the defense of Papelotte).[34]

This brings us to the composition of the different armies. As noted, in most cases the counters represent divisions or their equivalent, the chief exceptions being the two representing the two British heavy-cavalry brigades. In a few cases, units have, for the sake of convenience, been amalgamated into composite formations—the artillery counters, for example, represent all the guns of the corps of which they are a part, while the five British light-cavalry brigades are subsumed into two fictitious cavalry divisions, but on the whole the order of battle is accurate enough: to take the example of the two corps of line troops with which Napoleon started the battle, as was the case in 1815, that of Drouet has four infantry divisions and that of Reille three. What requires a little more comment, perhaps, is what the rival combat factors denote. On the day of the battle, Napoleon commanded 73,000 troops, Wellington 68,000, and Blücher 72,000; but in the game, the number of combat factors is not directly related to these figures, in that the first has 89, the second 75, and the third 61, the French therefore getting one combat factor for every 820 men, the British one for every 906, and, finally, the Prussians one for every 1,180.[35] The differences are not very great but, even so, it can be seen that some effort has been made to reflect the fact that Napoleon's troops were generally of higher quality than all those belonging to the opposition and, further, that the Prussian forces were worse again than those of Wellington.[36]

But we now come to a feature of the game that does not meet any expected standard of historical accuracy. In respect of the issues of deployment and chronology, there are four serious problems: first, that Napoleon's VI Corps is shown as being present on the field from the beginning of the battle when, as we have seen, it did not come up until the early afternoon; second, that the Anglo-Dutch garrisons of the very strong advanced posts constituted by the château of Hougoumont and the farms of La Haye Sainte and Papelotte are not adequately represented (indeed, in the last case, not represented at all); third, that, at midday, the battle begins too late; and, finally, that, at 1500, the Prussians appear on the field well before the time that they first made their appearance and, still worse, all at once and in the same place. There is a balance of gain and loss here with the first two factors favoring the French and the third and fourth the allies, but the combination of a late start to the battle and an early Prussian arrival exerts a stronger pull than its rival, thereby giving an unfair advantage to Wellington and Blücher. However, to speak in this fashion is to think of *Napoleon at Waterloo* in terms of gaming only; much more important is the fact that the errors of the game designers in this area render all hope of a historical simulation out of the question.[37]

Finally, there is the issue of the rules. As already noted, these are very short and the cost is necessarily much simplification. No provision is made for skirmishers and differences in formation (infantry, then, cannot form square or

switch from column to line and vice versa); other than usually fairly small differences in combat factors, all infantry and cavalry operate in the same way (though the higher combat factors awarded to British infantry divisions may hint at an implicit belief on the part of the designers that the line—their standard combat formation—was inherently superior to the columns favored by their enemy counterparts); units are fully functional and at full strength until they are destroyed, seemingly instantaneously; and there is no attempt to replicate either the fog of war or issues of command and control (the rival commanders enjoy a godlike view of the proverbial "other side of the hill" and can literally move their armies at the flick of a finger).

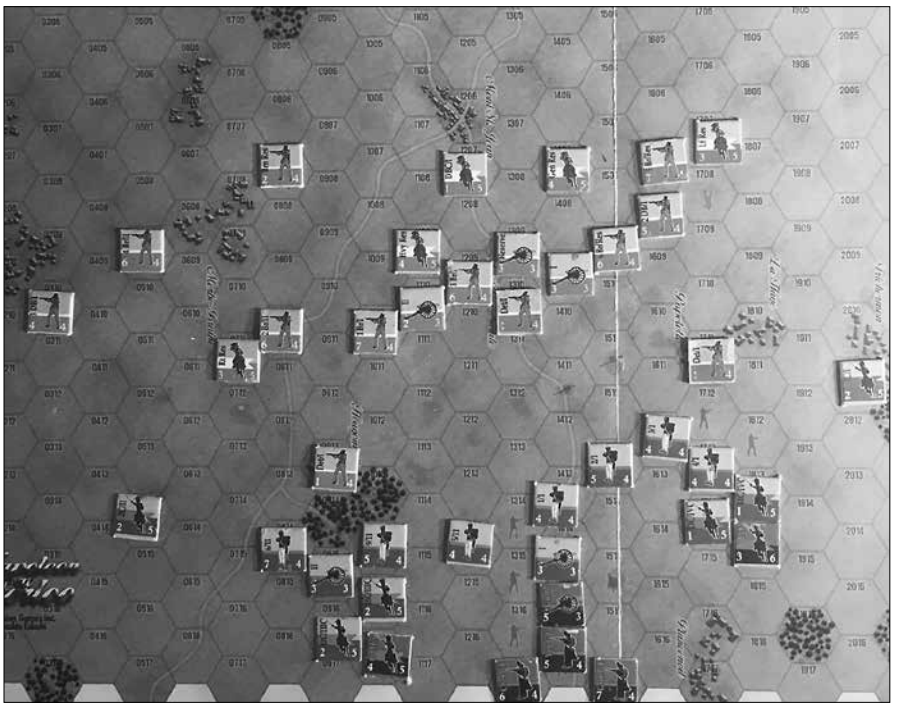
Yet, much of this is either easy to fix (players could, for example, keep all units inverted until they come into contact with the enemy)—or defensible (while problems of communication and, by extension, command and control, caused considerable problems in many Napoleonic battles, Waterloo was fought over such a small area that they had far less impact than normal). Certainly, there is no record of any unit's orders miscarrying or even being overly delayed in their arrival, while there is also the issue of the level of command: after all, both Wellington and Napoleon fought their battles at the level of grand tactics and did not usually concern themselves with the detail of how formations implemented the orders that they are given.[38] Viewed in this fashion, then, the only issue thrown up by the rules that is unequivocally open to question and impossible to deal with in terms of the latter's existing structures is the matter in which artillery fire is dealt with—the fact that its effects are determined using exactly the same combat-results table as that used for infantry and cavalry having the unfortunate result of making larger targets more vulnerable than smaller ones. And, finally, if the use of the conventional alternate move system whereby players take turns to move and fight is at first sight unrealistic, most real battles can be characterized as an extended series of actions and reactions.

One can, then, have reservations, but, if what is wanted is an introductory game, insofar as systems are concerned, *Napoleon at Waterloo* fits the bill very well, while the results that it delivers are not out of line with more ambitious attempts to model the battle such as Turning Point Simulations' recent *The Day of Waterloo, 1815 AD*. At the same time, it has the inestimable merits of being quick to play, many of the alternatives—the most obvious is SPI's *Wellington's Victory*—take considerably more time to work through than it took Napoleon and his opponents to fight the whole of the campaign of the Hundred Days from start to finish and, precisely because of the elision of questions of intelligence, particularly suitable for exploration on a solo basis. To demonstrate its value as a tool for the reconstruction of the events of 18 June 1815, we shall now follow the narrative of a particular game move-by-move. Before proceeding with this plan, however, it should be noted that the author has applied a

degree of customization so as to correct the errors in deployment and chronology already noted and at the same time introduce a small amount of extra detail with regard to the manner of representation, full details of which will be found in the accompanying appendix.

To begin, then, the battle is deemed to commence at 1100 rather than the 1200 specified in the rules. For the most part, the units are deployed in the positions stipulated for them by the designers, but here, too, there is a degree of change in that extra 1–4 detachments manufactured by photocopying the single unit of this type supplied with the game are placed in La Haye Sainte and Papelotte, and the incomplete VI Corps of General Mouton, together with the two stray cavalry divisions that had become attached to it, kept off the field pending their arrival in the French right rear in the early afternoon.[39] The forces concerned amounting to no fewer than 10 combat factors, the initial French advantage over the Anglo-Dutch is therefore instantly annulled, while, if the suggestion to the effect that no forces of the Imperial Guard other than the latter's artillery can move until 1500—a reflection of Napoleon's desire is to keep it in reserve as long as possible—is followed, the Army of the North will experience the initial loss of a further 25 combat factors.[40] All that is left for the initial

Figure 1. Situation at 1200—the armies of Wellington and Napoleon face up to one another astride the Brussels-Charleroi highway



Source: courtesy of author, adapted by MCUP.

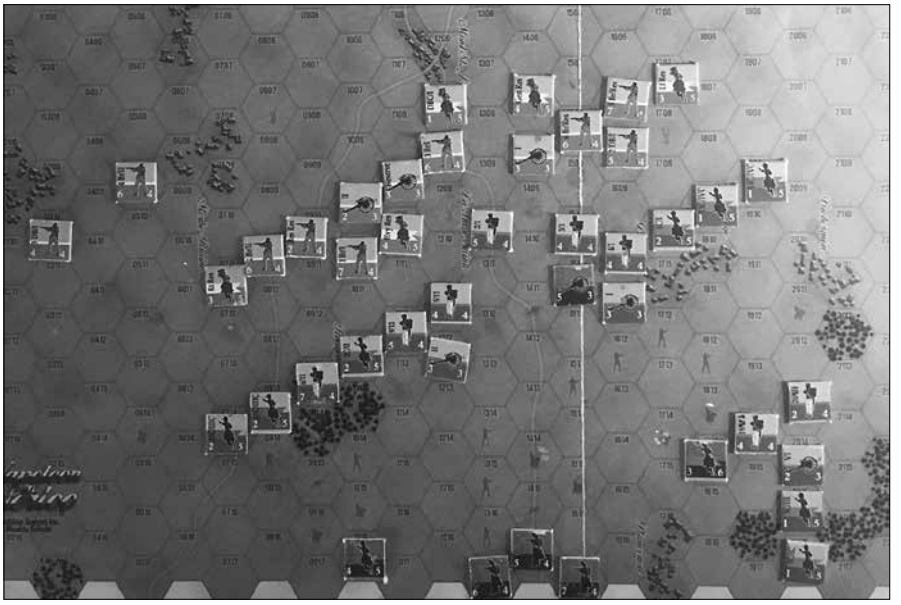
assault, then, will be the seven infantry and cavalry divisions of I and II Corps and the four cavalry divisions of III and IV Cavalry Corps. It is, of course, possible to leave VI Corps in place and allow immediate use of the Imperial Guard on the assumption, first, that the deluge of 17 June did not occur, and, second, that the emperor set aside all other considerations in favor of securing a decisive victory over any enemy army he managed to catch on its own, but, while this is an interesting exercise that will in all probability change the course of events, the battle thus produced will scarcely be that of Waterloo.

To move to the refight, the battle plan adopted by Napoleon was followed in its last detail. Thus, no sooner had move one began than on the left two divisions of Reille's corps assaulted Hougoumont, while on the right two divisions of Drouet's corps did the same at Papelotte. Supported in both cases by their corps artillery, the French prevailed at both places, killing or otherwise driving out their defenders but, clearly realizing that to move forward could expose the troops concerned to being overwhelmed, Wellington refrained from making any riposte other than to bring up the Brunswick corps—actually really only a small division of mixed infantry and cavalry—to buttress his front line above Hougoumont. Eager to exploit these early successes, in move two, supported on their left by elements of II Corps and on their right by the rest of I Corps and IV Cavalry Corps, the two left-hand divisions of I Corps stormed La Haye Sainte, albeit at the cost of heavy losses that put the first of them out of action, a desperate attempt to regain the farm on the part of Wellington being thrown back without any great effort.

With the French now in control of all three of the outposts shielding the Anglo-Dutch position, move three—deemed to begin at 1400—saw the French make further progress. Thus, on the extreme right, the third and fourth divisions of Drouet's corps pressed forward from Papelotte, supported by his corps cavalry and artillery and the whole of IV Cavalry Corps drove back the Anglo-Dutch left, the offensive also being joined by two divisions of II Corps, of which these last succeeded in making ground west of La Haye Sainte, only to be counterattacked in their turn, not least by the British heavy cavalry, and forced to relinquish some of their gains.

The respite earned by the cavalry charge was short-lived, however, move four seeing I Corps and IV Cavalry Corps, now reinforced by VI Corps, which had arrived on the field during the previous hour and came forward to support the attack on Wellington's left, consolidate their positions above Papelotte, and II Corps resume the positions from which it had just been driven, in the face of all which the Anglo-Dutch could only pull back their cavalry and artillery to keep it safe while at the same time seeking to reinforce those sectors of their line that were coming under pressure. Such passivity, of course, did nothing to wrest the initiative from the French, and the following move therefore saw the latter

Figure 2. Situation at 1500—just reinforced by the arrival of VI Corps, the French have taken Hougoumont, La Haye Sainte, and Papelotte and driven back Wellington's left

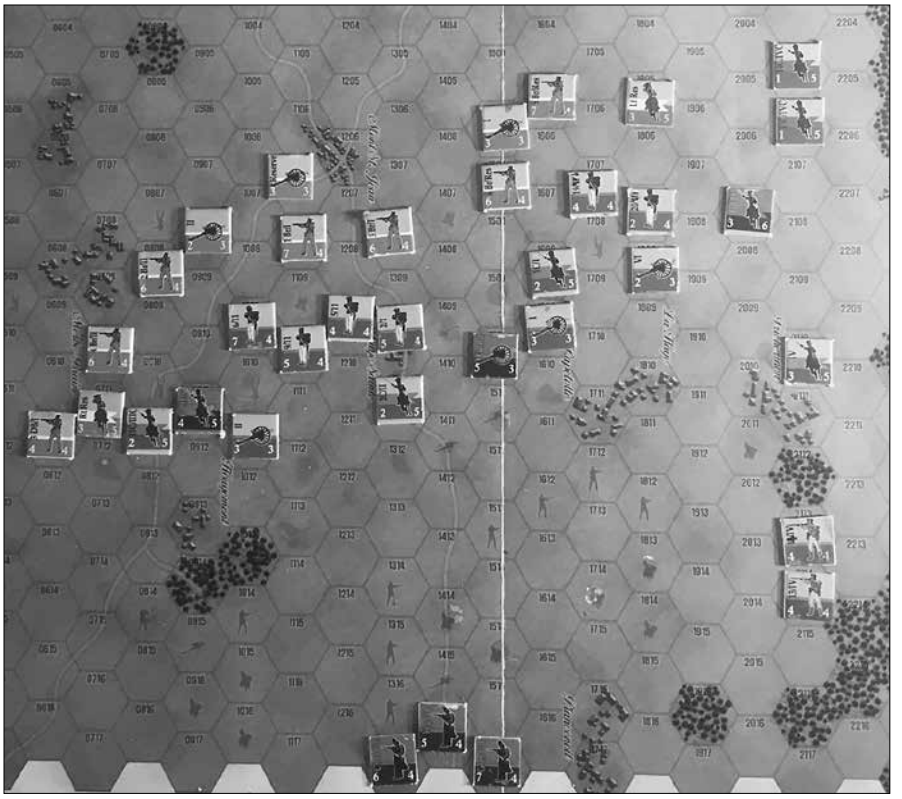


Source: courtesy of author, adapted by MCUP.

gain still more ground in the center: so far as the allies were concerned, then, it was very much a case of, as Wellington famously put it at about the same time in the real battle, "Either night or the Prussians must come."[41]

It was now 1700 and, though losses had been heavy on both sides, it was Napoleon who had the upper hand. Sure that the day was his, in move six, the emperor therefore increased the pressure still further, making more gains on the center and right and reinforcing II Corps with the heavy cavalry of the guard, the accompaniment to all this being further heavy losses to the Anglo-Dutch including, most seriously, their only two units of heavy cavalry. Yet, there was at last a flash of hope for Wellington: not only did the first units of Blücher's army appear on the high ground to the southeast but, seemingly at long last disabused of his abiding fear that Napoleon intended to drive in his right, the British commander called up the troops he had been using to safeguard his position from such a threat, making use of them in a highly effective attack that destroyed III Cavalry Corps.[42] As the afternoon drew on toward evening, the situation improved still further. Thus, although the Prussians, now on the field to the extent of a full corps, were contained by the three divisions of Imperial-Guard infantry—until then kept firmly in reserve—improvising a new defensive line east of Plancenoit, I, II, and VI Corps, and not just them but also III and IV Cavalry Corps, suddenly faltered and were checked all along the line.

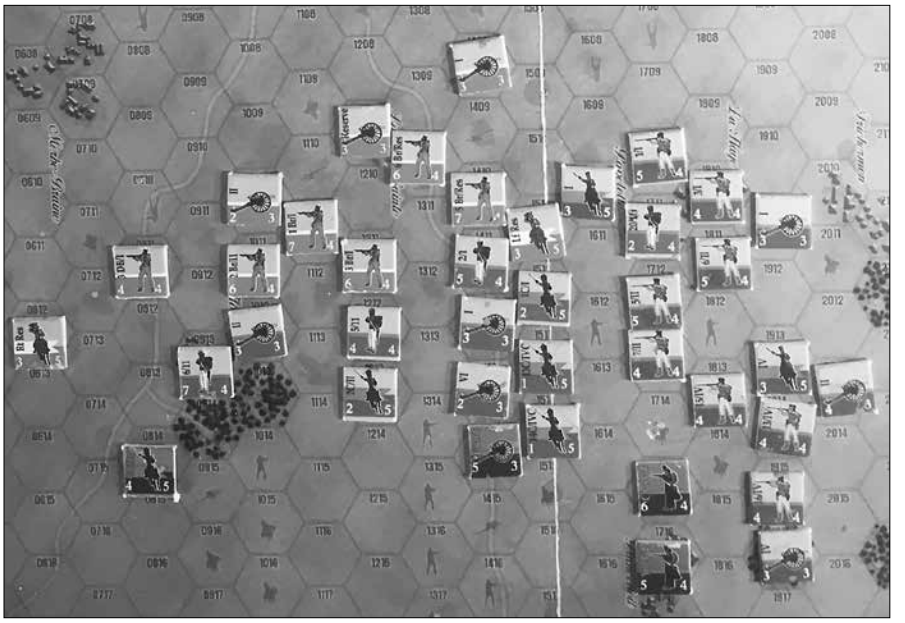
Figure 3. Situation at 1800—Wellington's left wing begins to disintegrate only for the first Prussian troops suddenly to appear in Napoleon's right rear



Source: courtesy of author, adapted by MCUP.

In the space of a mere two hours, then—it was now 1900—the wheel of fortune had turned full circle. Thus, the sudden collapse of the French attack marked the crisis of the battle, for Napoleon was forced to abandon all hope of breaking the Anglo-Dutch army, and instead adopt a defensive position resting on Hougoumont, La Haye Sainte, and Papelotte, while pulling back much of his surviving cavalry to form a reserve in the rear of his center. At Plancenoit, true, the Imperial Guard mounted an impressive counterattack that inflicted heavy casualties on the leading Prussians, but these losses were quickly replaced by fresh arrivals in the form of two more Prussian corps. Caught up in the torrent, the guards' grenadier division was destroyed, while Wellington threw his whole army into an assault on the enemy line, a move that soon had the French withdrawing from the exposed salient beyond Papelotte, attacked as this was from both sides. By dint of heroic efforts, by 2100, Napoleon had fashioned a new defensive line and, in addition, driven back the allies in several places by mounting local counterattacks, but all too clearly his only hope was a retreat to

Figure 4. Situation at 2100—although elements of the Imperial Guard succeed in blocking the way to Plancenoit and isolated French troops continued to fight on at Papelotte, the Army of the North faces an ever-growing risk of disintegration as it is driven into a small area around La Belle Alliance



Source: courtesy of author, adapted by MCUP.

the southwest. This move, however, was to be denied him, with the armies of Wellington and Blücher having now pressed in so closely that it was impossible for the emperor to disengage his forces. Finally brought to bay, the French fought hard and repeatedly forced individual allied units to retreat, but the pressure of numbers was too great even for the best troops to withstand. Amid growing confusion, Papelotte was overwhelmed, La Haye Sainte evacuated, and numerous units destroyed after being left with no means of retreat, only the garrison of Plancenoit continuing to hold out in a vain attempt to stem the Prussian tide. Their courage, however, proved unavailing: as the summer night fell so the Army of the North disintegrated, such troops who could streaming away to the southwest in complete disorder. Exactly as was the case in 1815, then, the *flight of the eagle*—the term often given to Napoleon's bid to regain power—was at an end, while, at 45 combat factors out of 89, Napoleon's losses were roughly comparable to the 34,000 men that he is generally reckoned as having lost in the actual battle.

More than 50 years old though it is, suitably modified, *Wellington at Waterloo* can therefore be reckoned an excellent platform on which to base a simulation of the battle: simple and straightforward to work with, it is clearly capable of delivering results that mirror the historical reality (having played through the

version of the game detailed here many times over, the author can report that it has never once delivered a French victory and only very rarely a draw). What, however, can be learned from the reconstruction of the events of 18 June 1815? In brief, while there is much to be said about the use of maneuver as a force multiplier in combat, the importance of combined arms and the need for coup d'oeil, the chief point that comes over is that, given the circumstances that prevailed on the morning of 18 June 1815, Napoleon had little chance of victory. Unable to start the battle until the day was well advanced due to the fact that even those troops who had reached the field were in no state to go into action; temporarily deprived of the services of one of his three infantry corps; and unwilling to commit the Imperial Guard, Napoleon lacked the hitting power necessary to inflict a decisive defeat on Wellington's forces before being hit by the thunderbolt constituted by the arrival of the Prussians. As we have seen, concentration on the Anglo-Dutch left could drive it in and inflict a lot of damage, but the fact that Blücher's men could not but hit the Army of the North in its right rear meant that, the more success was obtained, the more likely the troops involved in the assault were to find themselves in a trap. This would have applied as much on the day as in the reconstruction, but in reality the advance on Wellington's left achieved much less than it did in the latter. We come here to the influence of perhaps the most important event of the battle, namely the famous charge of the Household and Union Brigades. Launched at just the right moment by the commander of Wellington's cavalry, Henry Paget, Lord Uxbridge, this caught Drouet's corps at a serious disadvantage—having just hit the Anglo-Dutch line, it was badly disordered and swept it back in rout. The units representing the heavy cavalry being too weak to have anything like the same effect—it is most unlikely that they would ever be able to mount an attack at odds greater than one to one—nothing of the sort happened in the reconstruction, and so I Corps was able to press on regardless, just as VI Corps was able to march straight across the battlefield and get into action without delay.

Conclusion

In sum, it can be seen that using an appropriate board wargame to simulate the events of 18 June 1815 is a worthwhile exercise, not least because, properly configured, it immediately confronts anyone who tries it with the very difficult task that Napoleon faced on the morning of Waterloo; namely, having to break an enemy commanded by the best general his many opponents had ever fielded ensconced in excellent defensive positions at the head of an army that had already lost much of its hitting power, and that, unbeknownst to him, of course, in the face of significant time pressures. While the results obtained from *Napoleon at Waterloo* suggest that success was beyond the talents of the emperor and the prowess of his troops alike, in the actual battle the French nonetheless came

very close to securing at least a draw, if not a marginal victory, for throwing in the grenadiers and chasseurs of the Imperial Guard in a far more coherent fashion than was actually the case at 1800 rather than 1900 might just have broken Wellington's army and given the Prussians, at least some of whose commanders were deeply suspicious of the British, sufficient cause for alarm for them to break off their attack and fall back on Wavre. Yet, what such a result would have availed Napoleon is unclear: with much of his cavalry exhausted, the emperor could not have exploited his defeat of the Anglo-Dutch, the outcome being that Wellington could have escaped to the near-impregnable fortress of Antwerp just as Blücher would have retreated to Liège and possibly even beyond the Rhine. Brussels would have fallen, true, but it seems unlikely either that the population of Belgium would have risen in support of Napoleon or that the coalition facing him would have fallen apart (if the one had bitter memories of many years of French occupation, the other was absolutely rock-solid in its determination to bring down a man who had just proved once and for all that he was impossible to contain within the normal parameters of international relations). The war, then, would have continued, but, as a simulation of a wider nature would doubtless show, it was not one that the French would have been able to win. Sadly, however, while perfectly possible—the obvious place to go here is the 1815 scenario of Avalon Hill's game *War and Peace*—such a project must await another day.

Appendix[43]

As will have been noted, the point has repeatedly been made that, as published, *Napoleon at Waterloo* contains numerous errors that enormously reduce its value as a simulation. Herewith, then, the series of amendments that were introduced to remedy the situation.

1. The battle is deemed to begin at 1200 rather than 1300. Consideration might also be given to ending it at 2100 rather than 2200.
2. Infantry (but not cavalry or artillery) are permitted to enter woods hexes at the cost of an extra-movement point per hex.
3. Hougoumont, La Haye Sainte, and Papelotte are all designated as fortified hexes, thereby tripling the combat value of any occupants. Troops garrisoning them are never required to attack enemy units that are in contact with them and ignore DR (defender retreat) results.
4. To reflect the importance of the use of combined arms, attacks involving infantry, cavalry, and artillery are resolved on the next highest line of the Combat Results Table (i.e., a 1:1 attack now becomes a 2:1 attack).

5. Cavalry contacted by infantry alone may always withdraw one hex. In such cases, the infantry concerned will halt at the point of contact.
6. Detachment (i.e., 1–4) units should be provided for Hougoumont, La Haye Sainte, and Papelotte. Consideration should also be given to placing a 1–4 unit in the wooded hexes adjacent to Hougoumont.
7. The French artillery positions marked at hexes 1411 and 1511 are ignored, and the I Corps artillery placed at hex 1514 and the guard artillery at hex 1415. Meanwhile, note that the I Corps and II Corps artillery pieces have been transposed: it is the latter that should be at hex 0915 rather than the former.
8. The French infantry division stationed at hex 1714 should be moved to hex 1713.
9. The units belonging to VI Corps and the forces attached thereto (note: those marked as being placed in hexes 1315, 1316, 1414, 1415, and 1515) should be kept off the board at the start of the game, entering at 1400 at hex 2065. Note also that the two infantry divisions have been wrongly labeled as belonging to II Corps.
10. The optional rules governing the arrival of Blücher and Grouchy should be ignored: under all circumstances the former's troops will begin to enter the board at 1700 (see below).
11. In the real battle, while they eventually released the troops concerned, both Wellington and Napoleon kept considerable forces in reserve. In consequence, the infantry divisions on Wellington's right flank at hexes 0310 and 0509 cannot be moved until 1500, while, of the Imperial Guard, only the artillery may move at the start of the battle, the cavalry not being available until 1500, the Young Guard not until 1700, and the chasseurs and grenadiers not until 1800.
12. The arrival of the Prussians is put back to 1700, and is then broken down into three tranches, namely 1700: 13/IV, 14/IV, and IVC (hex 2312); 1800: 15/IV, 16/IV, and IV artillery (hex 2312); 1900: 5/II, 6/II, 7/II, IIC, II artillery (2312) and 1/I, 3/I, I artillery, IC, and IIIC (hexes 2307, 2308, or 2309).

Endnotes

1. See Charles J. Esdaile, *Napoleon, France and Waterloo: The Eagle Rejected* (Barnsley, UK: Pen & Sword Books, 2016); and Charles J. Esdaile, *Walking Waterloo: A Guide* (Barnsley, UK: Pen & Sword Books, 2019).

2. A full analysis is being undertaken in the context of a monograph that is currently under contract with the Marine Corps University Press.
3. Considerations of space mean that it is impossible to discuss the mechanisms by which the sort of games discussed in this article work. In brief, however, they generally feature a detailed scale map overlaid with a hexagonal grid that defines the precise position of each unit at any given time and also governs movement; cardboard counters printed with a variety of information relating to the units they represent (typically, the identity and type of the unit concerned, the number of movement points they were allowed to expend each move, and their value in combat); an odds-based, combat-results table; the use of dice throws to simulate the effect of chance; and, finally, the notion of zones of control, in brief an area of ground contiguous to each unit that the enemy could not enter without attacking the unit concerned and could not exit without first having driven off or, still better, destroyed, said enemy. For a full explanation, see Nicholas Palmer, *The Comprehensive Guide to Board Wargaming* (London: Barker, 1977); Nicholas Palmer, *The Best of Board Wargaming* (London: Barker, 1980); and James F. Dunnigan, *The Complete Wargames Handbook: How to Play, Design, and Find Them* (New York: William Morrow 1992).
4. Jon Freeman, *The Complete Book of Board Wargames* (New York: Simon and Schuster, 1980), 23.
5. In the wake of the COVID-19 pandemic, the battlefield has become much harder to visit for travelers coming from outside the European community. However, those who wish to tour La Haye Sainte, Hougoumont, and the rest could do worse than to access the downloadable application developed by the author in conjunction with the Belgian War Heritage Institute, this being available for free for both Apple and Android. For full details, visit the Google Play site and type "University of Liverpool" in the search box to download the Waterloo app.
6. There are many accounts of the Waterloo campaign. For a recent version that is particularly closely argued, see John Hussey, *Waterloo: The Campaign of 1815*, vol. 1, *From Elba to Ligny and Quatre Bras* (London: Greenhill Books, 2017), 340–584; and John Hussey, *Waterloo: The Campaign of 1815*, vol. 2, *From Waterloo to the Restoration of Peace in Europe* (London: Greenhill Books, 2017), 1–53.
7. For a good example, one might cite David G. Chandler, *Waterloo: The Hundred Days* (Oxford: Osprey, 1980), 112. Thus: "Wellington's position . . . occupied a low ridge set slightly south of the village of Mont Saint Jean. . . . Behind this line . . . were a number of useful rear slopes. To the fore of it, the ground was broken to the east of the Brussels high road by a number of small rises and depressions, but the western sector was a relatively flat and unbroken area." Setting aside the fact that this passage appears to confuse the two halves of the battle with one another, it is so vague as to be useless.
8. To the best of the author's knowledge, the most detailed piece of its sort that has ever been published, the description offered in this article of the battlefield of Waterloo is the fruit of detailed exploration of the whole area in the course of the elaboration of *Walking Waterloo.*
9. One idea that has been much stressed is that Wellington feared for his links with Ostend, a port that had indeed witnessed the disembarkation of many of his troops and their attendant equipment and stores. However, it having been shown that Wellington planned to retreat on Antwerp rather than Ostend, this line of argument can be discounted. See Gareth Glover, *Waterloo: Myth and Reality* (Barnsley, UK: Pen and Sword Military, 2014), 105.
10. To write thus in defiance of the insistence of so many authorities that either Hougoumont or La Haye Sainte were the key to the Battle of Waterloo may seem foolhardy, but a close study of the ground makes it all but impossible to take such claims at face value.
11. It is customary to refer to Marshal Michel Ney rather than the Duc d'Elchingen. That being the case, logic dictates that Drouet and his counterpart at the head of VI Corps, Gen Mouton, should be referred to by their surnames rather than their titles (i.e., Erlon and Lobau).

12. The disposition of the French army is another matter that is poorly handled by the traditional historiography. Herewith, for example, David Chandler on the position of Mouton's troops and the infantry of the guard: "In central reserve on each side of the Brussels road, Napoleon deployed his reserves. To the east of Maison du Roi [a small hamlet on the main highway] were placed the long cavalry columns of [Gen Jean Siméon] Domon's and [Gen Jacques Gervaise] Subervie's divisions. . . . On the opposite side of the road were the infantry columns of Simmer's and Jeannin's divisions. Last but by no means least stood the serried ranks of the Imperial Guard, flanked by the guns of the artillery reserve on either side of the farm of Rossomme." Chandler, *Waterloo*, 121–22. Setting aside the fact that Chandler is again muddled in his grasp of the detail—Maison du Roi is actually south of Rossomme rather than north—like many other historians he was misled by Napoleon's attempts to rewrite history so as to hide his many errors. For the actual situation, see Bernard Coppens, *Les mensonges de Waterloo: les manipulations de l'histoire enfin révélées* (Brussels: Jourdan Editeur, 2009), 249–54.
13. Much influenced by Napoleon's attempts to blame everybody but himself for his defeat at Waterloo, many historians have laid the responsibility for everything that went wrong on 18 June at Ney's door. However, there is no evidence that the marshal ever did anything other than relay the orders that were conveyed to him by his imperial master. It is possible that the climactic attack of the guard may in part have miscarried by a failure on his part to keep the 10 battalions concerned together, but this is clearly the utmost limit of his fault.
14. Basing his work on the emperor's later claims, Chandler is happy with the traditional version, writing baldly, "No time was to be wasted on manoeuvre: success was to be won by a series of massive frontal assaults." Chandler, *Waterloo*, 126. However, as a number of later historians have pointed out, the original documents and, in particular, an order dictated around 1100, prove beyond all doubt that it was the outflanking maneuver that was the chosen battle plan. See Tim Clayton, *Waterloo: Four Days that Changed Europe's Destiny* (London: Little, Brown, 2014), 365.
15. Few aspects of Waterloo have given rise to more controversy than the actions of Marshal Grouchy. For a full-length discussion of his part in events, see Paul L. Dawson, *Napoleon and Grouchy: The Last Great Waterloo Mystery Unravelled* (Barnsley, UK: Frontline Books, 2020).
16. It is generally agreed that the battle proper began at around 1130. To explain the delay in going into action, apologists for Napoleon have always claimed that he wanted the ground to dry out after the downpours of the previous 18 hours. For example, Chandler, *Waterloo*, 126. However, as anyone who has walked the battlefield in the wake of heavy rain can attest, to imagine that a mere two hours could have made the slightest difference is whimsical in the extreme. What occasioned the delay, then, was rather simply that large parts of Napoleon's army were still on their way to the battlefield.
17. For the defense of Hougoumont, see Julian Paget and Derek Saunders, *Hougoumont: The Key to Victory at Waterloo* (Barnsley, UK: Pen and Sword, 1999).
18. Paul L. Dawson, *Waterloo: The Truth at Last—Why Napoleon Lost the Great Battle* (Barnsley, UK: Frontline Books, 2018), 63–64.
19. Glover, *Waterloo*, 122–29; and Coppens, *Les mensonges de Waterloo*, 199–209.
20. It has been repeatedly claimed that the artillery concerned started the battle emplaced on the ridge attacked by the British cavalry, but this is manifestly untrue: to have deployed the batteries in so exposed a position in the presence of an enemy whose every disposition was almost completely unknown would have been to risk disaster, while the presence of the guns and all their attendant crews, limbers, and caissons would have rendered the advance of Drouet's infantry all but impossible.
21. Glover, *Waterloo*, 133–43.
22. The explanation for the great French cavalry attack is far from clear and will always be a matter for dispute. According to the traditional version, the entire responsibility belonged to a Marshal Ney convinced by movement on the ridge (probably the withdrawal of a number of artillery batteries that had run out of ammunition) that Welling-

ton was retreating. However, this was the view put about by Napoleon and therefore cannot but be regarded as being open to question. Just as doubtful, meanwhile, is the alternative claim that Ney ordered only a single division—that of Milhaud—to ascend the ridge, the rest of the French cavalry then becoming carried away by excitement and following on of their own volition. That being the case, the consensus is now that, while Ney does indeed seem to have ordered a brigade of cavalry to ascend the ridge, this was rather to support a fresh attack on La Haye Sainte, the general advance rather being the work of the emperor alone, a view for which support can be found in the memoirs of imperial aide-de-camp, Flahaut. See Clayton, *Waterloo*, 456–58; Hussey, *Waterloo,* vol. 2, 142–44; and Alessandro Barbero, *The Battle: A History of the Battle of Waterloo* (London: Atlantic Books, 2003), 244–45. However, that said, it is but fair to note that other authors, including the normally skeptical Coppens, remain convinced that, while the emperor may have ordered various units to support the initial advance, the initiative came from Ney. See Dawson, *Waterloo*, 182–86; Coppens, *Les Mensonges de Waterloo*, 225–36; and Glover, *Waterloo*, 145.

23. Glover, *Waterloo*, 146–51; Hussey, *Waterloo*, 142–48; and Dawson, *Waterloo*, 185–250, 281–308.
24. For an analysis of the Prussian advance from Wavre and, more particularly, the reasons for the delay in their arrival, see Hussey, *Waterloo*, vol. 2, 150–59. Meanwhile, a number of French accounts showing that, far from having been sent from an entirely fictitious position in rear of the French center to contain the Prussians, Mouton's men were rather taken by surprise while waiting to be dispatched in support of a second attack on Wellington's left are retailed in Dawson, *Waterloo*, 250–55. Meanwhile, for two demolitions of the claim that Napoleon had forewarning of the Prussian advance, see Glover, *Waterloo*, 172; and Coppens, *Les Mensonges de Waterloo*, 187–97. In brief, the claims clearly rest on nothing more than invention, one issue that is particularly problematic being the fact that at 1300, no Prussians had reached a spot even remotely visible from Napoleon's then command post at Rossomme.
25. The best account in English of Bulow's advance and the subsequent battle for Plancenoit is Glover, *Waterloo*, 168–73.
26. For the defense of La Haye Sainte, see Brendan Simms, *The Longest Afternoon: The 400 Men Who Decided the Fate of Waterloo* (London: Allen Lane, 2014). Meanwhile, that Napoleon rejected Ney's appeals for reinforcements is accepted even by historians predisposed to give Napoleon the benefit of every possible doubt. For example, Chandler, *Waterloo*, 155–56.
27. The defeat of the infantry of the Imperial Guard has given rise to an extensive historiography. See, for example, Gareth Glover, *Waterloo: The Defeat of Napoleon's Imperial Guard—Henry Clinton, the Second Division and the End of a Two-Hundred-Year-Old Controversy* (Barnsley, UK: Pen and Sword, 2015); and Nigel Sale, *The Lie at the Heart of Waterloo: The Battle's Last Hidden Half-Hour* (Stroud, UK: History Press, 2014).
28. The idea that Zeithen's corps broke the right wing of the French Army has been fiercely denied by some British historians. For example, Hussey, *Waterloo*, 205–6. However, the evidence of the topography is incontrovertible. For a good account of Zeithen's attack, see Barbero, *The Battle*, 332–36.
29. Dawson, *Waterloo*, 394–401. The comment is, perhaps, a little unfair, but the idea of the grenadiers and chasseurs of the Old Guard standing firm in square while being shot to pieces by their victorious opponents is a myth: the units concerned appear not to have collapsed in rout, but nor did they fight to the end, rather withdrawing from the field step-by-step in good order.
30. There is, in fact, an expansion pack pitched at the level of the brigade rather than the division with more complex rules and a much larger number of playing pieces.
31. See "The Triumph of Minimalism over Excessive Detail," Board Game Geek, accessed 14 November 2020. A new edition, *Napoleon at Waterloo*, characterized by far more attractive graphics is currently available from Decision Games. For reviews and discussion, see "Napoleon at Waterloo (1971)," Board Game Geek, accessed 28 August 2014.

32. See "Napoleon at War: Napoleon at Waterloo," Hexwar.net, accessed 28 August 2014; and "Napoleon at Waterloo Print and Play," Kobudovenlo.nl, accessed 28 August 2014. For discussions of the use of wargames as a training aid, see Philip Sabin, *Simulating War: Studying War through Simulation Games* (London: Continuum International Publishing Group, 2014).
33. See "Waterloo," Command Post Games, accessed 4 June 2020.
34. For a detailed assessment that is inclined to support this view, see Veronica Baker-Smith, *Wellington's Hidden Heroes: The Dutch and the Belgians at Waterloo* (Oxford, UK: Casemate Publishers, 2015).
35. We have exact strengths for the two armies that fought at Waterloo, namely 67,661 for that of Wellington and 71,947 for that of Napoleon. The Prussian figure, by contrast, is an estimate. See Chandler, *Waterloo*, 116–23.
36. The quality of an army obviously rests on a mixture of factors including leadership, organization, training, morale, tactical doctrine, and armament. That being the case, attempting to sum them up in a single numerical value is difficult, but many historians would agree that this ranking is accurate enough. For example, Chandler, *Waterloo*, 52–70.
37. As *Napoleon at Waterloo* is presented, it is the opinion of the author that the French player cannot win without either (a) the Prussians arriving much later or not at all, or (b) Grouchy appearing in the nick of time and bringing succor to Napoleon. In fact, both possibilities are catered for. Grouchy, indeed, gets a full set of counters (note: these are excluded from the figures given above)—but, so far as this article is concerned, the issue will be ignored as being irrelevant from the point of view of the simulation on which it is based.
38. Insofar as command and control are concerned, the issue is further elided by the fact that each turn represents one hour of real time, a period easily long enough for a general to get a formation reasonably close to his headquarters on the move and even into action. It should be remembered here that regiments held in reserve or manning quiet sectors of the line were habitually kept under arms in formations that permitted rapid movement.
39. A small number of other changes are also recommended of which the most important is the one precluding the French from stationing artillery in the no-man's-land between them and the Anglo-Dutch front line, but these have much less bearing on the course of play and can therefore be left to the sidebar.
40. Why Napoleon kept back the guard is deeply puzzling: after all, even if he was ignorant of the fact that Blücher was marching to join Wellington, he did know that his best chance was at all times to press the two enemy commanders to the utmost and seize every conceivable opportunity to defeat them in detail. In answer, one can but suggest, first, a genuine belief that it would not be needed and, second, the same nagging sense of self-doubt that had caused him to hold back the Imperial Guard at Borodino and thereby cast away his sole chance of a decisive victory.
41. This quote from Wellington is one of a number of remarks he is credited with having uttered in the course of the battle. As such, they are widely quoted—for example, see, in this case, Barbero, *The Battle*, 325—but it is recognized that they may be apocryphal, and all the more so as they exist in several different versions, Clayton, for example, rendering the comment quoted here as "the Lord send night or Blücher!" Clayton, *Waterloo,* 514.
42. One of the few oddities in respect of Wellington's handling of Waterloo is his fixation with the idea that Napoleon was planning to envelop the western flank of his army despite the fact that, even with the given that the French could be assumed to be uncertain of the precise position of the Prussian forces, such a move could not but have the effect of pushing the Anglo-Dutch in the latter's direction. This delusion on the part of the British commander has never been satisfactorily explained, but its effects were clear enough: thus, not only were a disproportionate number of his troops deployed on his right wing, but this last was refused so as to present a defensive front to any outflanking move. Eventually freed by the ever-more obvious fact that Napoleon had

no intention of making a serious move on Wellington's right, the units concerned did at least come to play a part in the battle, albeit not until the day was well-advanced. Not so, however, the 17,000 men who had previously been posted to the distant town of Halles so as, in effect, to prolong Wellington's right still further: though no farther away than Blücher was at Wavre, the troops concerned were left without orders all day, waiting for an attack that never came and, still worse, increasingly clearly was never going to materialize.

43. This appendix is based on Rob Gibson, "Improving the Basic Napoleon at Waterloo," *Phoenix*, no. 3 (October 1976).

Promise Unfulfilled
A Brief History of Educational Wargaming in the Marine Corps

Sebastian J. Bae and Major Ian T. Brown, USMC

Abstract: This article offers a comprehensive historical overview of educational wargaming in the U.S. Marine Corps and how it can evolve in the future. The tradition of leveraging wargames for educational and training purposes is deeply rooted in the Marine Corps. From humble beginnings at the Naval War College to Service-wide wargaming initiatives like TACWAR, the Marine Corps has always sought to develop the intellectual edge of its Marines through wargames. Yet, in successive decades, the Marine Corps has consistently struggled to maintain its wargaming efforts. This article concludes with recommendations on how to develop, expand, and evolve educational wargaming in the Marine Corps.

Keywords: wargaming, professional military education, tactical warfare, TACWAR, Naval War College, Lieutenant Colonel Earl H. Ellis

Buried in the "General Correspondence" section of Admiral William S. Sims's papers at the Library of Congress is a short and anonymously authored satirical poem, part of a collection of similar rhymes apparently composed for the amusement of dinner guests on some semiformal occasion

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in the spring of 1913. The authors here learned of the poem by sheer happenstance, from another writer who was researching Sims's later career for an entirely separate project. Yet, despite its anonymity and obscurity, this epigram illuminates both the earliest engagements by the Marine Corps in the educational wargaming realm, as well as how impactful Marines could be when given wargaming as a learning tool. The poem reads as follows:

> There's a frisky marine they call Ellis
> Whose ability makes some folks jealous
> He's a soldier all right
> But a tactical blight.
> He can plot on the board
> So your fleet's always gored.
> He can hand you a whack
> From a torpedo attack,
> And with gleeful elation he'll quell us.[1]

The events cited in the poem do not appear in the various brief descriptions of the subject's life at that time.[2] The "frisky" Ellis is, of course, then-Major Earl H. Ellis, well known for his contributions to the amphibious warfare doctrine that would prove vital in digging Japanese forces out from their Pacific island holdings in World War II. The game in which Ellis "gored" his opponents was the *Tactical Game* used at the Naval War College in Newport, Rhode Island, and which received accolades from senior U.S. Navy leaders as equally vital in preparing naval officers for the challenges of the Pacific War.[3] Yet, the poem's very obscurity highlights a grimmer aspect of the relationship U.S. Marines would have with educational wargaming in the century that followed. Marines could learn, adapt to their opponents, and demonstrate enthusiasm and brilliance when they embraced the promise wargaming offered; too often, the Corps' institutional embrace slackened or vanished entirely, leaving the promise unfulfilled.

This article will review and assess the history of educational wargaming in the U.S. Marine Corps, from its tentative engagement before the Great War through today. It will also offer recommendations on how the Corps can institutionalize its embrace of educational wargaming, so that its use as a tool for honing Marines' minds against those of thinking human adversaries does not ebb and flow based on the whims of individual leaders. For the argument that the current Commandant of the Marine Corps, General David H. Berger, made in his 2019 *Commandant's Planning Guidance* (CPG) is one that has been true since Ellis gored enemy fleets more than a hundred years ago: "wargaming is . . . a set of tools for structured thinking about military problems within a competitive framework—in the presence of that 'thinking enemy'

who lies at the heart of our doctrinal understanding of war."[4] It is long past time that the Corps makes the value of this truth available to all its ranks; as collectively noted by America's maritime Service chiefs, the aggressive growth and modernization of revisionist naval powers is leveling the playing field in the materiel realm.[5] The cognitive realm is the last open to Marines for securing an asymmetric advantage against competitors—the promise offered by a vibrant culture of educational wargaming is one that can no longer be left on the shelf, unfulfilled.

The Beginning—The World at War

The Marine Corps' early historical relationship with wargaming was tangential to the U.S. Navy's significantly more robust wargaming culture, which developed in earnest near the end of the nineteenth century. The history of both the U.S. Naval War College and its adoption of wargaming as part of its curriculum has been exhaustively covered by others, though it is worth noting the relative speed with which the War College incorporated wargaming following its founding. Formally established in 1884, thanks to the efforts of naval reformers like Commodore Stephen B. Luce, it was only a few years later in 1889 that an old compatriot of Luce's, Captain William McCarty Little, ran the first "war problem"; from 1894 onward, the Naval War College was running wargames annually.[6] At first, these games simply filled a training void created by the fact that the Navy's relatively few ships were often scattered by operational commitments that could not be justifiably abrogated to give a few officers hands-on training time; on one rare occasion, Luce *was* able to assemble a fleet for some practical application, but bureaucratic in-fighting prevented a recurrence for many more years.[7] Following World War I, as concern about Japanese expansion in the Pacific grew and the U.S. Navy's hull count grew along with it, War College games would develop doctrine and tactics that fed directly into live exercises for validation or correction.[8]

As for the game itself, over the years it too evolved from Little's initial conception. Little initially introduced three different games conducted at different scales: the *Duel* was a one-on-one contest between ships, the *Fleet Tactical* game pitted two fleets against each other, and the *Strategic* game captured the movements of multiple fleets across a wide geographic area.[9] Players maneuvered ships represented by cardboard or celluloid strips across gridded playing areas in the first two cases; in the latter, given the scope of thousands of miles of open ocean, players used navigational charts instead.[10] In 1905, the War College discontinued the *Duel* but retained the other two; moreover, the 1905 rules revision recognized that the wargames had moved from being a stop-gap training device to a valuable tool that blended instruction and experimentation with real-world implications for the fleet.[11] In his study of the Navy's doctrinal

Figure 1. Naval War College gaming at its height: in 1934, the War College dedicated Pringle Hall as the center of wargaming on campus. The floor of the room is the gridded game board; the two black-and-white sticks in the foreground were used to measure gunnery and torpedo ranges, and the white objects in the center were templates for ship movement

Source: photo courtesy of Naval War College Museum, adapted by MCUP.

evolution during the first half of the twentieth century, Trent Hone explained this two-track learning system:

> During the war games, officers gained experience applying military principles to varied combat situations. Outside the simulations and using feedback from them, officers continually refined and improved the rules of the games as they gained experience handling ships and formations at sea.[12]

The game's physical proportions reflected the truth of Hone's characterization of this organic feedback mechanism: the college eventually replaced gridded sheets of paper with gridded playing boards filling whole rooms, and on the cusp of World War II, the "Maneuver Rules" encompassed everything from refueling at sea to fickle radio communications to the employment of the yet-unblooded carrier-borne aircraft.[13]

As for what the game offered to its players, Little noted that the key distinguishing factor of the wargame from other classes or map problems was "the existence of the enemy, a live, vigorous enemy in the next room waiting feverishly to take advantage of any of our mistakes, ever ready to puncture any visionary scheme, to haul us down to earth."[14] Admiral Sims—Ellis's mentor who also twice served as Naval War College president—said "no other service" in a naval officer's career could replace the priceless value of maneuvering fleets "on the

game board week after week . . . against a similar fleet representing a possible enemy."[15] Sims continued:

> In no other way can this training be had except by assembling about a game board a large body of experienced officers divided into two groups and "fighting" two great modern fleets against each other—not once, or a few times, but continually until the application of the correct principles becomes as rapid and as automatic as the plays of an expert football team.[16]

The cumulative result of this intensive, iterative educational method was exposure of a full generation of wartime naval leadership to myriad challenges imposed by a thinking enemy, with the requirement to think critically and decide rapidly; as Admiral Chester W. Nimitz observed, when war came "[it] had been reenacted in the game room . . . by so many people in so many different ways that nothing that happened during the war was a surprise."[17]

Where, in this remarkable environment, were the members of America's other naval Service: the Marines? Certainly they were not idle; as the Navy did following World War I, Marine Corps leaders also focused on the threat of looming conflict with Japan in the Pacific, with Ellis playing a key role in the early postwar years. Ellis's former brigade commander, General John A. Lejeune, had been appointed Commandant of the Marine Corps in 1920, and Lejeune was already moving to transform the Corps' role into a force that would "accompany the Fleet for operations ashore in support of the Fleet."[18] Lejeune tapped Ellis to develop a Corps-focused corollary plan to the Navy's own Pacific-centric War Plan Orange, which Ellis fleshed out into the now famous Operation Plan 712, "Advanced Base Force Operations in Micronesia."[19] In July 1921, General Lejeune approved Ellis's plan and decreed that it would shape future war planning, training, education, and force design across the Marine Corps.[20]

Marine leaders of Lejeune's tenure and after energetically implementing this vision in the two decades following his pronouncement, developing—despite resource and personnel shortages of all kinds in the lean interwar years—the framework for amphibious assault that would guide American landing operations in all theaters in World War II. Activities conducted by Marines during these years included participating in the Navy's fleet problems and Fleet landing exercises; performing field maneuvers at Civil War battlefields to test new equipment, weapons, and staff organization; integrating naval aviation into ground operations; reorganizing the Marine Corps Schools system; codifying amphibious assault doctrine in the *Tentative Manual for Landing Operations*; developing suitable landing craft to support amphibious operations; and reorganizing the Corps' force structure into a formal Fleet Marine Force (FMF)

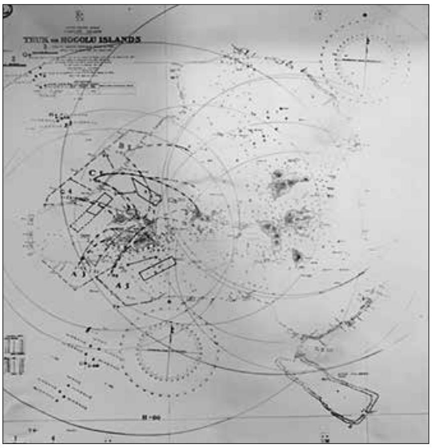
tailor-made to execute Lejeune's original goal of seizing and protecting advanced bases in support of the Navy's broader naval campaign.[21] This was an impressive list of institutional preparation for the conflict that in 1941 finally came to America's shores; oddly absent, especially given the increased cross-pollination of Navy and Marine Corps leaders in many of these activities, was any exercise similar to the Naval War College's wargame that might give Marine leaders the same cognitive advantages gained from repeatedly testing themselves against a thinking adversary.

This omission seems strange, given that the key Marine Corps leaders during this period were certainly aware of the War College's *Fleet Tactical* and *Strategic* wargames. Ellis's assignment at the War College was an outlier for officers of his junior grade, but starting in 1921, General Lejeune established a pattern of sending field-grade Marine officers to the Naval War College's planning staff on a regular basis.[22] It is possible that not every Marine officer so assigned had the opportunity to directly participate in a wargame, but some certainly did, such as then-colonel Thomas Holcomb, who later became Commandant in December 1936—he attended the senior course from June 1930–June 1931 and had a front-row seat for games that simulated naval actions in War Plan Orange.[23] One Colonel Arthur T. Marix was sufficiently aware of, and impressed by, the War College's game to argue in 1924 that it was "the next best thing to handling . . . actual fleets" and that the game "not only [developed] the players, but . . . actually [points] to new methods as well as eliminate[s] unsound ideas."[24]

Moreover, beginning in 1931, the Corps' Field Officers School in Quantico, Virginia, launched a series of yearly Advanced Base Problems that were done directly in conjunction with the Naval War College's own wargames.[25] Each of these problems looked at the defense or seizure of an advanced base inside the naval theater of operation then being examined by the War College's students. Poorly documented in the historiography of this era, the Advanced Base Problems are tantalizing as a potential hidden gem of Marine Corps wargaming, especially given their direct linkage with the Naval War College.

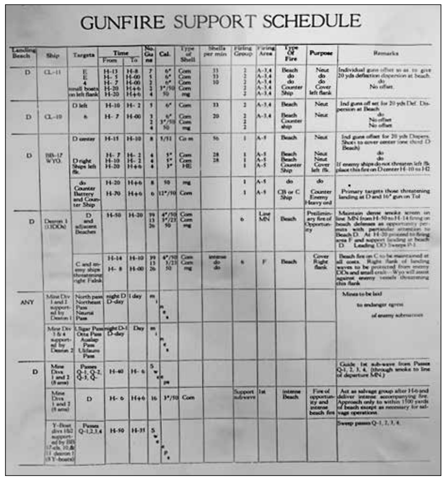
Yet, on examining the documents still available from those problems, the evidence shows that they were, at best, highly detailed planning exercises. This is not to gainsay the obvious value of detailed planning, and the level of detail in the final products generated by the analysis done in each Advanced Base Problem is truly impressive. Take the Advanced Base Problem II: Truk Area as an example—two independent teams of Marine officers developed their own solutions to the assigned problem, and each solution contained planning annexes such as intelligence assessments; task organization; operational landing schedules; landing craft requirements; food, water, and medical supply stocks; landing beach assignments; naval gunfire support schedules; allocation and scheduling of air support; hydrography and terrain analysis, and many other

Figure 2. Landing beaches, landing craft marshalling areas, and naval gunfire support positions from one of the solutions to Advanced Base Problem: Truk



Source: Historical Resources Branch, Marine Corps History Division, Quantico, VA.

Figure 3. Naval gunfire support schedule from one of the solutions to Advanced Base Problem: Truk


GUNFIRE SUPPORT SCHEDULE

Landing Beach	Ship	Targets	Time From	Time To	No. Guns	Cal.	Type of Shell	Shells per min	Firing Group	Firing Area	Type Of Fire	Purpose	Remarks

Source: Historical Resources Branch, Marine Corps History Division, Quantico, VA.

factors.[26] Moreover, it is fascinating to see the names of men like Clifton B. Cates, Oliver P. Smith, and Graves B. Erskine—who in later years would make their own marks on Marine Corps history—appear on the annex pages as student planners and presenters.[27]

However, one of the opening comments in the "Special Instructional Memorandum" that laid out the guidelines for solving the Truk scenario touched on both the value of conjoining Marine students with their War College counterparts and the unintentional admission that Marines were limiting the mechanics of solving the problem to planning:

> These contacts with the Naval War College are of inestimable value to both Schools and serve to establish methods and doctrines applicable to Landing Operations. Particularly do they illustrate the capabilities and limitations of the various units of the Fleet Marine Force, when employed in the seizure and defense of advanced bases. Similarly, the presentations demonstrate the preparation and planning so essential to success and the assistance required on the part of the Fleet or component parts thereof, in support of the FMF, when the latter is assigned a specific task.[28]

The hundreds of detailed pages covering planning factors in the solutions to the Advanced Base Problems were unarguably vital for the real-world seizure or defense of the islands analyzed. But there is no evidence that these problems

were "gamed" against an adversarial force of human opponents in the way the Navy's Fleet wargames were. Thus, it is fair to wonder, in the spirit of Colonel Marix's comment in 1924, what other FMF "capabilities and limitations" might have been illuminated during the conduct of the Advanced Base Problems had those units been countered by a free-thinking enemy, just as the Navy's ships were on the gridded floor of the War College's Pringle Hall.

Once fully engaged in World War II's Pacific theater, the Corps' training and educational foci naturally bent toward winning the issue at hand; once the war ended, Marines quickly shifted toward grappling with the new theoretical challenges of battle in the nuclear age, as well as the real-world crisis that exploded on the Korean Peninsula in 1950. As such, what little formal discourse on wargaming there had been within the Corps dried up, at least in print—though interestingly, Marine Corps Schools continued to execute the Advanced Base Problem series until at least the late 1950s. Ironically, the "Introductory Remarks" to one of the final problems captured both the continued recognized value of these detailed "what if" planning exercises and the enduring ghost of what more they might have accomplished:

> This [Advanced Base Problem or ABP] has often been criticized for reaching too far into the future. It has been said that it should be confined to current capabilities, and more in tune with the day to day activities of the operating forces. I submit that it is the rightful and proper function of the ABP to look into the future—state objectives—describe goals and to stimulate all of our thinking about what we must do; design; teach now in order that we will have a viable, reading, effective capability by the time 1962, 1972, or 1982 is a reality and not a 5, 10, or 20 year improbability.
>
> If we have destroyed any degree of complacency that may heretofore have existed as to the state of the amphibious art—present or future—if we cause you to disagree with us—to question, etc., then we have accomplished our purpose![29]

This intent echoed that of the Naval War College wargame, to imagine—as the War College did, with games that included nascent radio communication, radar, and carrier-borne aviation—how new technologies and concepts might function in future conflicts. But, to paraphrase Little and Marix, the Advanced Base Problems still lacked that one thing that distinguished an educational wargame from a map exercise; that key ingredient that developed the game players and pointed to new good ideas while challenging old bad ones; that force which, like no other, can truly destroy institutional complacency: a thinking, freely acting enemy. It would not be until 1960, with tensions peaking in the

Cold War, that Marines would attempt to develop an educational game that made such an enemy manifest.

Establishing Marine Corps Educational Wargaming

In 1960, the Corps established the Marine Corps Landing Force Development Center (MCLFDC) with the explicit mission of advancing the art of amphibious warfare. Within this expansive mandate a subordinate component of MCLFDC—the War Games Group, also later called the War Games Branch—was similarly tasked with developing and conducting wargames to explore and assess the art of amphibious warfare. The War Games Group consisted of planning, control, and playing sections and also acted as the official office of record for all Marine Corps wargaming. However, the MCLFDC principally focused on manual, rigidly adjudicated wargames for analysis and research.[30] This also included a Joint wargaming initiative with the Navy called the Navy-Marine Corps Amphibious War Game.[31]

MCLFDC's hallmark wargame was the *Landing Force War Game* (LFWG) that would later be adapted and integrated into a wider family of Marine Corps manual wargames. A double-blind design, the LFWG allowed teams to game maneuver, tactics, weapon systems, and intentions of the opposing force. Gameplay broke down into four broad steps: teams conducted planning, individual players issued mission orders to subordinate units, the white cell adjudicated combat and other actions, and players received feedback in various forms such as intelligence reports. While teams enjoyed relatively free play, most actions were rigidly adjudicated through an intricate system of rules, combat result tables (CRTs), and flow charts. The core strength of LFWG was its realism and attention to granular detail, aiming to replicate and reflect real-life processes and constraints on commanders in combat. This was further complemented by detailed weapons ranges, probabilities of detection, and the effects of combined arms operations. However, the heavy, granular design detail also proved cumbersome and tedious, requiring significant time dedicated to gameplay. For instance, replicating 24 hours of combat operations required roughly six months of gameplay.[32] Yet, despite its shortcomings, for decades the LFWG remained the central game platform for Marine Corps wargaming, both in education and analysis. The LFWG was even leveraged for Service-level wargames, as in November 1972 when the Corps conducted two LFWG-based wargames called Atlas I and Atlas II. These two wargames featured a Marine amphibious unit operating in the Straits of Gibraltar to examine how the Service could contribute to naval sea control.[33]

Analytical wargaming remained at the forefront of the Corps' priorities throughout the early years of MCLFDC's operation, reflecting the insecurities of a Service defending its relevance in a changing security environment. A

1965 student field study at the Amphibious Warfare School (AWS) describes MCLFDC as an analytical-focused wargaming organization, where "educational goals are secondary, almost incidental."[34] Nevertheless, a grassroots movement to leverage wargaming for educational and training purposes steadily grew in the Marine Corps Schools. In 1961, a small, unofficial wargaming group existed at the schools, though it remained an informal island lacking an official training mandate. Nevertheless, a growing number of Marines showed a willingness to explore wargaming as a tool for education. One of the earliest mentions of wargaming in a Marine Corps educational curriculum came from a student field study by Captain Jack E. Dausman at the Junior and Senior Schools. In "War Gaming as an Instructional Device in Teaching Tactical Principles to Marine Corps Officers," he advocated for the increased use of wargames, stressing their utility of direct engagement with complex problems. Dausman cited a map-based wargame by a Lieutenant Colonel Hale in 1961–62 as a gold standard Marine education could foster and build on. In this game, students could conduct both offensive and defensive operations over two to three days in conjunction with the normal schedule of lectures, command post exercises, and examinations.[35] The calls for further integration of educational wargaming increased in successive years. In 1964, Major David H. Wagner similarly explored the application of wargaming at AWS. He recommended conducting an official survey of how the curriculum could be adapted to incorporate wargaming. Moreover, he recommended leveraging the expertise and capabilities at the MCLFDC to foster this initiative.[36] In his field study, he pointedly concluded: "the advantages of war gaming technique on the learning process of the AWS would more than justify the time and effort involved to modify the curriculum."[37]

By 1965, the MCLFDC adapted its analytical LFWG into an educational edition, appropriately named the *Educational War Game*. The *Educational War Game* was a simplified and distilled version of the LFWG, boasting the same central mechanics and rules. It was intended to assist field commanders in training Marines, emphasizing staff procedures, decision making, and a competitive simulation of combat. Like the LFWG, the sequence of play broke down into several phases: issuing orders, white cell adjudication, and a feedback loop of reports. A blue and red team would issue a series of orders, which were in turn adjudicated by the control cell. The control cell relayed the resulting combat or related intelligence to the appropriate team in a variety of reports or even simulated radio traffic. Played on a 1:25,000 or 1:50,000 scale map, the opposing teams had no contact with each other. Teams needed to employ reconnaissance and maneuver to glean intelligence. Reflecting its analytical roots, the *Educational War Game* featured a heavily deterministic approach to combat, grounded in a series of CRTs and flow charts. For instance, ground combat required

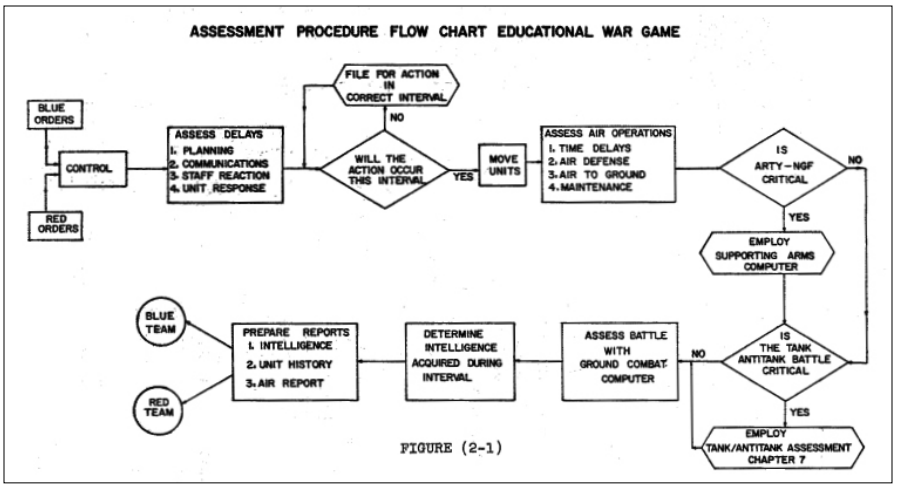
that the control cell use a Ground Combat Computer, a series of concentric circles in a double-faced dial. The control cell inputted factors like range, the combat power of units engaged, and supporting fires into the Ground Combat Computer, which produced an assessment on ground engagements including casualties. Yet, chance and probability were not wholly excluded from the game system. A random number table was used to determine the probability of certain events occurring, particularly incidents beyond the scope of the rigid game system.[38]

The *Educational War Game* offered several strengths as an educational tool. Like the LFWG, it admirably replicated staff procedures, processes, and considerations within the game mechanics. Commanders had to consume a variety of reports, operate under imperfect knowledge, and consider a wide spectrum of variables such as route trafficability and enemy weapon systems. Furthermore, the game system did not allow instantaneous orders but featured a table that outlined the delays between echelons—a communication between a platoon and regiment was delayed 10 minutes. This forced commanders to consider both space and time as their units, represented by unit markers on pins, maneuvered about the game map. Moreover, the *Educational War Game* incorporated a variety of capabilities in specific tables, such as naval gunfire, artillery support, and aerial reconnaissance.[39]

Like the LFWG, however, the *Educational War Game* was hampered by complicated rules and laborious gameplay. As shown in the figure below, the adjudication of actions in a turn involved a series of calculations, laden with CRTs and other tables. Unsurprisingly, this also required a significant time commitment to play through multiple game turns. Moreover, the wargame demanded a well-versed and capable control cell to manage the litany of adjudication requirements. The balance of fidelity to real-world operations and playability became a continuing theme in Marine Corps wargaming.[40] At the same time, the *Educational War Game*, despite its geographic modality, could not satisfy the myriad educational wargaming requirements across the Service. There was no single wargame solution to educating and training across all ranks and experience levels in the Corps. A student attending the Amphibious School in 1970 highlighted this point, arguing that the War Game Branch should provide additional support to professional military education to include training facilitators and develop a tailored Marine Amphibious Brigade-level (MAB) wargame.[41]

Moreover, the *Educational War Game* was not widely disseminated or implemented across the Service. Its intensive labor and time requirements hindered Service-wide application. Lamenting this state of affairs, in a 1973 article, Captain Douglas C. MacCaskill noted, "In my nine years in the Corps, I have never seen an attempt to train young officers, in the tactical profession, on the wargame board."[42] Shifting away from complex professional wargames, he ar-

Figure 4. Turn adjudication sequence for the *Educational War Game*



Source: the Educational War Game *(Quantico, VA: Marine Corps Landing Force Development Center, Marine Corps Schools, 1965), 2–10.*

gued for the use of commercial wargames, such as *Panzerblitz* (1970) by Avalon Hill and *Red Star-White Star* (1972) by Simulations Publications Incorporated (SPI). This philosophy of adapting commercial wargames for professional military education foreshadowed a pivotal shift in how the Corps approached educational wargaming in the years to follow.[43]

The Golden Age

Through the late 1970s and late 1990s, Marine Corps educational wargaming saw its high-water mark, benefiting from the complementary use of Service-designed and commercial wargames. Similarly, the 1970s represented the golden age of commercial board wargames, featuring a tsunami of game titles from companies like Avalon Hill and SPI that shaped a generation of wargamers. For most of the 1970s, SPI published the vast majority of commercial wargames, accounting for more than 50 percent of all wargames produced globally. The subsequent popularity and interest in manual wargames spurred other enduring initiatives such as the publication of *Strategy & Tactics* magazine and Origins, the first national civilian wargaming convention, both of which remain active today. Prior to this era, there was a stubborn gap between the professional study of arms and wargaming for entertainment. By 1974, that divide was steadily shrinking. A key example of this merger was the U.S. Army's embrace of SPI's *Firefight* wargame for tactical ground combat. The Marines followed suit in the 1980s when a new generation of wargame-minded officers would push it to the forefront of the Service's imagination.[44]

Colonel John C. Studt was the commanding officer of the 3d Marine Regiment, 1st Marine Brigade; he was also a board game hobbyist and emerged as one of the most vocal and energetic advocates for wargaming in the 1970s.[45] In 1976, he directed First Lieutenant I. L. Holdridge to develop and build a regimental-level wargame with the explicit purpose of training the regimental and battalion staffs against a thinking adversary. Holdridge modified an Army wargame called *Pegasus* to create a unique Marine version, *Pegasus II*. In its mechanics, *Pegasus II* blended a traditional command post exercise with a rigid map-based wargame. The sequence of gameplay was divided into three phases: decision, execution, and reporting, reminiscent of the *Educational War Game* and LFWG. Each phase was further divided into smaller segments. For instance, the execution stage was comprised of indirect fire, preplanned fire missions, and movement and close assault. In practice, participants were assigned to game players, representing maneuver units, command posts at the battalion and regimental levels, and higher headquarters. Each group issued orders to subordinate units or relayed information to higher echelons. This multilayered gameplay enabled concurrent training and simulated real-life processes. Players on both sides had to coordinate across groups, contend with logistical procedures, and ensure the flow of information between echelons. Most of all, the wargame spurred intense discussion about tactics, enemy capabilities, and the profession of arms to enhance teamwork and individual understanding. This practice of wargaming for training was institutionalized in the 3d Marines' Combat Simulation Center, based in its regimental classroom with accompanying duty officers.[46] This led to the tradition of 3d Marines adapting Army wargames for its own educational purposes.[47]

By 1981, the Marine Corps finally designed and established its own unique series of wargames, collectively referred to as TACWAR. Emulating the use of kriegspiel in Prussian regiments and building on the legacy of the LFWG and *Educational War Game*, this was the institution's first concerted effort to firmly establish a culture of wargaming across the Service. The TACWAR family of wargames consisted of four distinct but related titles: a company-level wargame called *TACWAR*; a battalion and Marine Amphibious Unit staff-level wargame called *STEELTHRUST*; a game aimed at regimental and MAB staffs called *LANDING FORCE*; and a strategic-level wargame for MAB and Marine Amphibious Force staffs called *WARFARE*. Designed by the Manual Wargames Project and supervised by the director of training at Headquarters Marine Corps and the Naval Training and Equipment Center, the TACWAR series sought to inculcate a robust gaming culture for all ranks. Ambitious in its vision, the Corps planned to issue 284 copies of *TACWAR* to units by 1983, hoping to equip every rifle company with a copy.[48]

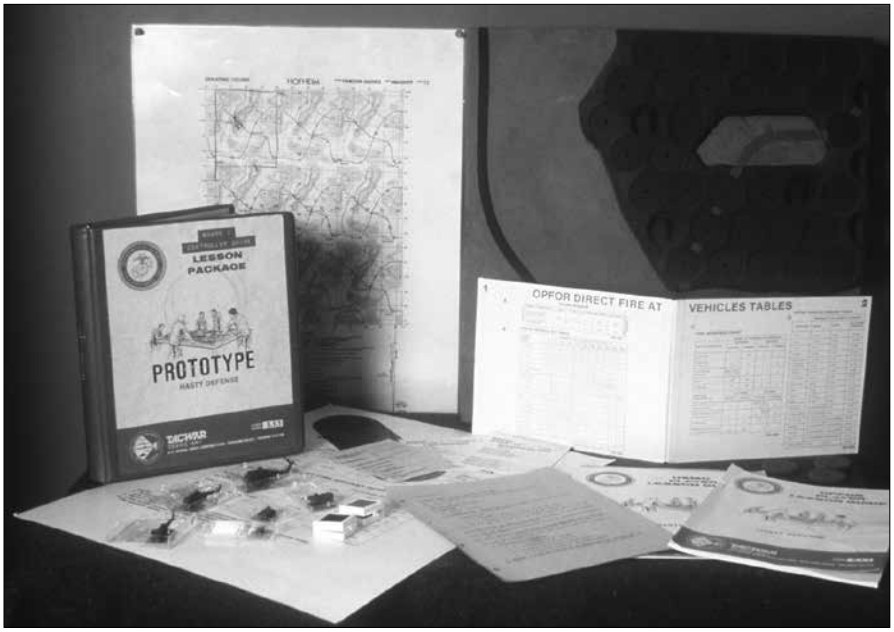
TACWAR represented a significant leap forward in the Corps' educational

wargaming effort, both in game design and institutionalization. Cognizant of the LFWG's shortcomings, the new wargames sought to better balance playability and fidelity. *TACWAR* generally reflected the structure of the *Educational War Game* from the 1960s, but it included several commercial game mechanics and features—the use of miniatures, time pulses to simulate simultaneous action, and basic and advanced rulesets for differing levels of player experience.[49] Moreover, by 1990, the TACWAR series offered three terrain modules: basic, amphibious, and desert.[50] Overall, *TACWAR* offered a comprehensive ecosystem for training and education across multiple echelons. Though each title was unique in format and intended demographics, the TACWAR system shared key characteristics: simulating the interactive dynamic between opposing sides, replicating the fog and friction of warfare, enhancing the decision making of players, and improving understanding of enemy tactics and capabilities.[51]

Unlike earlier piecemeal efforts to institutionalize wargaming in the Marine Corps, the TACWAR suite of wargames actually generated a widespread use of a game throughout the organization. By 1982, *TACWAR* was being used at the Basic School and Marine Staff Noncommissioned Officer (SNCO) Academy, and its employment proliferated through the 1990s.[52] Disappointingly, the bright start and ambitious vision for *TACWAR* later found itself tarnished by the mission creep in game design that regularly conflates a need for greater complexity to make a wargame realistic. Like its predecessors, as the Marine Corps later revised *TACWAR,* the complexity of the game series, time required to both learn and facilitate the games, and even physical space demands all increased.[53] Critics increasingly argued that the TACWAR series was too expensive and onerous to execute compared with earlier Marine Corps wargames.[54] Sadly, the revisions intended to make TACWAR a one-size-fits-all gaming platform instead, as Captain Stuart Bracken acerbically noted, saw it collapse under its own weight and largely abandoned by the late 1990s: "neglected at all levels . . . stacked like cordwood in warehouses . . . bogged down in its own procedures . . . so muddled with administrative minutiae that players soon become bored and their initial enthusiasm is lost."[55] This was an ominous sign that the golden age of Marine Corps educational wargaming was ebbing.

The 1980s also saw the advent of the Corps experimenting with computer-driven wargames, beginning with the Tactical Warfare Simulation, Evaluation, and Analysis System (TWSEAS). Leveraging a venerable, 25-year-old U.S. Navy fire control computer, TWSEAS was largely used as a command post exercise training tool. Its key advantages were an ability to provide realistic training from across multiple command echelons and computerized—hence more rapid—adjudication of combat results. Though imperfect, TWSEAS enabled consistent unit-level training at a minimal cost. Major Wesley M. Anderson

Figure 5. A sampling of *TACWAR* rules, CRTs, game components, and associated lessons package, c. 1986



Source: U.S. National Archives and Records Administration.

Figure 6. A team of Marines playing *TACWAR* (left), with white cell adjudicator (right)

Source: U.S. National Archives and Records Administration.

noted that Fleet Marine Force Pacific, through that decade alone, conducted more than 70 command post exercises using TWSEAS. The success of this first digital wargame framework drove the development of a second: the Marine Air Ground Task Force Tactical Warfare Simulation (MTWS). With the promise of improved hardware and software, MTWS was heralded as the bright successor to TWSEAS.[56] However, though still in use today, MTWS also slowly suffered the mission creep of *TACWAR*, becoming a niche capability requiring specialized contractors and significant communications network support.[57]

Concurrent with official efforts to institutionalize education wargaming, a movement led by several Marine officers to leverage the well-developed capabilities offered by commercial wargames took form. In a 1984 *Marine Corps Gazette* article, Lieutenant Colonel P. D. Reissner argued that commercial wargames—if used properly—provided the same fundamental educational value as games designed and promulgated by the Service. This was because both types of wargames, at their core, offered players a variety of problems to overcome; allowed them to practice decision making; and enabled iterative and experiential learning. Reissner concluded, "As training tools, the complex, sometimes slow games have as much value as the less complex, highly playable ones. Much depends on the training objective."[58] He cogently noted that purpose drove the form of a wargame; thus, the Service should not shackle itself to a narrow conception of game format or design. In that vein, Reissner recommended every Marine Corps division should maintain a varied library of commercial wargames, pairing each game with a reading list to further drive the gaming experience home. Reissner concluded his article with a table of wargames, coded by title, manufacturer, complexity, solitaire playability, playing time, lessons taught (according to training objectives), and recommendations for specific demographics. *Afrika Corps*, *Napoleon's Art of War*, *Fulda Gap*, and *Squad Leader* were among the titles included.[59]

Driven by the advancement of prolific commercial game designs and the advent of digital wargames, the Corps' embrace of commercial wargaming as a valued tool for professional military education (PME) accelerated at the end of the Cold War. In 1989, Captain Eric M. Walters published a review of several wargames—including exemplars of the era's top game designs like *Victory in the Pacific* and *Sixth Fleet: Modern Naval Combat in the Mediterranean* (1985)—highlighting their advantages and unique game mechanics.[60] Walters wrote extensively about educational wargaming throughout his career, constantly advocating for their value in learning military history—they were not childhood playthings, he argued, but when used well, serious instruments of study.[61] In a later 1990 *Gazette* article, Walters explained that the core utility of wargaming lay in its provision of experiential opportunities for players to practically engage with abstract concepts like the Corps' newly minted maneuver warfare philos-

ophy.[62] They stood alone in the promise offered to the military leader: "There is simply no other medium as powerful and yet as inexpensive that can so realistically test your military judgment and practical understanding of maneuver warfare."[63] Walters's writings on commercial games as educational tools inspired other liked-minded Marines, former and active duty, to provide recommendations of their own.[64] The prominence of the commercial gaming debate even led to a discussion on employing wargames to evaluate officers for command.[65]

Beyond promoting wargaming in its pages, the 1990s-era *Marine Corps Gazette* also gave its readers a practical forum for testing their decision-making skills with monthly tactical decision games (TDGs). The author of the first series of TDGs—Captain John F. Schmitt—was better known as the author of the *Warfighting*, Fleet Marine Force Manual (FMFM) 1, yet his TDG series also had a profound influence on the Service's conception of strategy, campaigning, and operational art. TDGs posed specific tactical or operational situations; *Gazette* readers were required to produce a solution within the time constraints of the scenario and submit that solution in writing to the *Gazette*'s editor. Unlike traditional manual wargames, TDGs presented the player with a one-move tactical problem or tactical puzzle. Nevertheless, the TDG tradition became ingrained into Marine Corps culture, used by a wide number of training and educational entities as a central vector for tactical decision making.[66] By 1994, Schmitt cemented this legacy with the publication of *Mastering Tactics: A Tactical Decision Games Workbook*, an extensive collection of TDGs for training and education.[67] However, as with *TACWAR* and the Corps' computerized games, as time went on *Mastering Tactics* and the later TDGs were not universally acclaimed. Critics argued the scenarios had become overladen with cumbersome and extraneous requirements. TDGs were supposed to be bounded tactical glimpses into a battle; thus, any extraneous details and requirements beyond the moment bogged down the player's thought process and risked them being mentally outmaneuvered.[68] Nevertheless, Schmitt's influence continued into the twenty-first century, both through his own writing on TDGs and tactical decision making and projects based on his work such as the 2003 *Design and Delivery of Tactical Decision Games* workbook.[69]

Discussion and execution of commercial wargames as a PME method was not restricted to the pages of the *Gazette*. Wargaming clubs and isolated communities of interest sprung up throughout the Corps, in many ways reminiscent of the kriegspiel clubs in the nineteenth century Prussian army. Captain Walters helped establish the Camp Pendleton Conflict Simulation Club—still in operation today—where civilians and active-duty Marines gathered to play a variety of games.[70] Another captain, Lance Clemens, founded a board wargaming club at Camp Hansen in Okinawa, Japan, in the early 1990s. These unofficial groups created a sense of community for wargamers in the Corps.[71] As

the golden age of Corps wargaming faded approaching the twenty-first century, these isolated yet enthusiastic grassroots initiatives were one of the few things to endure, shaping from the shadows those efforts extant in the Corps today.

Even in the deserts of Iraq on the eve of Operation Desert Storm (January 1991), Marines were using wargames to train and educate themselves. In 1991, 7th Regiment, 7th Marine Expeditionary Brigade (7th MEB), was readying itself for war with Iraqi dictator Saddam Hussein's Republican Guard. In its ranks was First Lieutenant Steve Dethlefsen, an intelligence officer and Scout Sniper Platoon commander. His unit was tasked with securing a company-size Iraqi position, dominated by a formidable triangle defense inspired by Soviet doctrine. To prepare his subordinates and fellow commanders, Dethlefsen employed *Advanced Squad Leader*, an iconic commercial wargame by Multi-Man Publishing and Avalon Hill. Adapting the game's *Code of Bushido* module, Dethlefsen and his peers rehearsed infantry tactics on the gameboard for a week. The results were sobering. Most of the participants employed doctrinal tactics, aiming to breach the broad side of the triangle defenses in a company-wide formation. All but one failed, with their cardboard Marines decimated by interlocking fields of Iraqi fire. However, Captain Sherman, commander of Company H of 3d Battalion, 9th Marines, devised a leapfrogging approach, where platoon-size elements breached the far side of the berm. Supported by mortars, smoke, and heavy weapons, successive platoons could breach the trenches and eliminate Iraqi defenses in detail via close combat. Of all the rehearsals, this proved the most effective. Ultimately, Task Force Ripper, reinforced by 1st Marine Expeditionary Force, deployed regiments supported by tanks and division-assets to seize the defensive positions. Yet, in those few instances where infantry seized the positions, the tactics rehearsed in *Advanced Squad Leader* proved invaluable.[72]

Two other developments marked the zenith of Marine Corps educational wargaming in the late twentieth century before decline settled in. The first came in 1997, when General Charles C. Krulak, 31st Commandant of the Marine Corps, issued *Marine Corps Order (MCO) 1500.55, Military Thinking and Decision Making Exercises*. The order made explicit the "imperative that all Marines make every effort to exercise and develop their decision-making abilities."[73] Radical and innovative in many ways, this relatively short MCO laid the groundwork for a number of unprecedented actions, such as the authorization to install and play approved computer-based wargames on government computers for educational purposes. Beyond that, *MCO 1500.55* promoted the use of TDGs, commercial wargames, and even recommended a catalog of approved computer-based wargames curated by the Marine Corps Modeling and Simulation Management Office (MCMSMO). Most radically, the order mandated that commanders at all levels use wargames to train and educate their subordinates.[74]

A key output of *MCO 1500.55* was *Marine Doom*, a military adaption of the popular commercial *Doom II* first-person shooter video game. Also released in 1997, *Marine Doom* was an instant hit, both within the Corps and without. At the cost of $49.95, Lieutenant Scott Barnett and Sergeant Dan Snyder, in collaboration with MCMSMO, coded a software patch to import Marine Corps weapons systems into *Doom*'s science-fiction landscape. *Marine Doom* was emblematic of a long Corps tradition of developing decision-making opportunities for its Marines in an era of lean military budgets.[75] Having secured appropriate copyright permissions, MCMSMO made *Marine Doom* available as a free download from the official Marine Corps website.[76] Unfortunately, a sequel project by Barnett and Synder, an adaption of the commercial video game *Quake* called *Battlesight Zero*, did not share the same amount of success.[77] Nevertheless, *Marine Doom* showed what could be done by leveraging commercial games for training and education.

In this spirit, in 1999, the Navy and Marine Corps Intelligence Training Center (NMITC) piloted *TacOps* in its curriculum for training ground intelligence officers.[78] Originally designed by retired Major I. L. Holdridge and published in 1994 by Battlefront.com, *TacOps* was a commercial tactical-level, combined arms digital wargame. With a solitaire and two-player mode, *TacOps* players could command modern U.S. forces with corresponding weapon systems, including Marine Corps units. Featuring a diverse set of scenarios, players could play myriad missions and units, ranging from companies to brigades, against a modern opposition force.[79] Typically, intelligence training mainly focused on the static generation of specific intelligence products. By using *TacOps*, the students could actually implement their intelligence products in the wargame's framework and see the outcomes of their work, for good or ill.[80] A 2000 Center for Naval Analyses (CNA) report highlighted the prospective value of using *TacOps* for training and education—such uses included threat evaluation and the development and refinement of the collection plan.[81] At the same time, *InfoChess*, a modified chess game with added layers of information warfare, was also introduced as a training tool for the Marine Air Ground Task Force Intelligence Officer course at NMITC.[82] Unfortunately, the experimentation with *TacOps* did not gain long-term traction, and it would not take long for the sudden onset of the Global War on Terrorism (GWOT) in 2001 to consume the Marine Corps' attention for a generation. The late decades of the twentieth century saw an unprecedented number of efforts to develop both educational wargames and a culture of wargaming throughout the Corps. These efforts included titles formally created by the institution, like *TACWAR* and *TacOps*; the adoption and adaptation of commercial tabletop board games; and exploration of the potential offered by the emerging medium of video games. Yet, despite the volume and enthusiasm of these specific programs, the Corps—

Figure 7. Table from the 2000 CNA report on *TacOps* and its potential uses in support of education

Table 3. Wargame attributes supporting specific mission skills and intelligence skills

Wargame attributes	Skills supported
Terrain system: effect on movement	Describe battlespace effects (IPB) - Analyze avenues of approach - Produce mobility overlays
Terrain system: effect on LOS and direct fires	Describe battlespace effects (IPB) - Analyze observation and fields of fire - Produce LOS overlays
Threat models and doctrinal behavior implementation	Evaluate the threat (IPB)
Ability to position Blue assets and acquire data according to detailed COA analysis and PIRs	Develop and refine the collection plan
Ability to "see" the plan executed - Detailed graphic display of game play	Compare planned execution to observed actual execution
Ability to cancel/change/issue orders to subordinates - Mutual execution/pause play system	Issue revised orders as required

Source: William D. Brobst and Alan C. Brown, Integrating Wargaming into the NMITC Curriculum: TacOps Demo *(Alexandria, VA: Center for Naval Analyses, 2000), 46.*

as a whole—could not successfully link them together to reach a critical mass that might endure past the billet timelines of the individuals driving them. It would be another two decades before wargaming again gained the attention of the highest Marine leadership.

A Generation of War and the Decline of Wargaming

As the ever-growing and competing priorities of the GWOT-dominated Service thinking, educational wargaming across the Marine Corps waned dramatically between the 2000s and mid-2010s. Immediate operational concerns in Afghanistan and Iraq absorbed institutional bandwidth. For many Marines, the Service was at war and had no time for games. This was an ironic perspective, given the decades just spent highlighting the ability of wargames to inculcate decision making and critical thinking across a broad population. Wargames were arguably precisely the type of tool a large organization would want to get as many of its members as possible ready for the difficult decisions required in a counterinsurgency environment. Analytical wargaming did continue with a renewed focus, as seen by the return of the Service's Title 10 wargame *Expeditionary Warrior* (EW).[83] But Title 10 games were inherently limited in their audience; for most Marines, the broad exposure to educational wargaming across the Corps was a shadow of its former self. Where it persisted, it was confined to small islands of excellence and limited to the energies devoted to it by a motivated individual. Institutionally prominent platforms like TACWAR, or popular and accessible games like *Marine Doom,* faded from memory.

New voices and initiatives periodically sought to fan the fading flame of educational wargaming. In 2000, Captain John C. Ketcherside wrote a review of the *Operational Art of War*, a computer-based, operational-level wargame. Echoing arguments made by Walters and others, Ketcherside extolled the wargame's realistic, well-researched table of organization and equipment for modern forces, along with its inclusion of weather, terrain, supply, and other factors. Though *Operational Art of War's* level of detail might seem daunting at first, Ketcherside argued that it nevertheless offered a unique training and educational opportunity for Marines. The scenario editor allowed players to create maps, tailor specific units, and customize the wargame's mechanics to specific training and learning objectives.[84] He concluded that "anyone with a personal or professional interest in operational-level warfare should have this game in their gear bag."[85]

Similarly, the early 2000s saw several Marines undertake—in the tradition of *Marine Doom*—the adaptation of the Close Combat series of digital wargames published by Atomic Games. Prior to this adaptation, Major Brendan B. McBreen used *Close Combat* throughout his infantry career to train and educate fellow Marines and inspire discussion on the profession of arms. In 2004, the Corps took this a step further. The *Close Combat* game engine became the platform for *Close Combat Marine,* which McBreen helped play-test and was officially released by the Marine Corps's Training and Education Command (TECOM) in 2004.[86] The *Marine Corps Gazette* included a copy of *Close Combat Marine* with accompanying workbook, authored by McBreen, in its issues for several months.[87] The wargame was later integrated into the 08104 course for staff noncommissioned officers (SNCOs) through the Marine Corps Institute. Like *Marine Doom, Close Combat Marine* aimed to cultivate small unit infantry tactical decision making while integrating the many advances in digital gaming and computing not available in 1997. It incorporated the essentials of close quarter combat: suppression, terrain, mutual support of fire, and a range of modern weapon and sensor capabilities. Its more robust game engine provided many more opportunities for variations in repetitive and iterative learning, new tactical challenges, and the complexities of the twenty-first century battlefield.[88] Despite the formal support of TECOM and the *Gazette, Close Combat Marine* did not achieve the staying power of the Corps' previous golden age wargames, overshadowed as it was by increasing Service preoccupation with the wars in Iraq and Afghanistan.[89]

Captain Ketcherside captured the disjointed and diminished state of this era's educational wargaming in a *Gazette* article that accompanied the same 2004 special issue that promoted *Close Combat Marine*. Ketcherside lamented that educational wargaming in the Marine Corps was characterized by "ignorance and apathy."[90] The Service's newfound passion for high-level, complex

analytical wargames provided virtually nothing of value for junior officers and noncommissioned officers. He argued that the Corps should return to its previously successful leveraging of commercial wargames like *Westfront*, citing the fruitful use of *Steel Panthers* by 1st Battalion, 6th Marines.[91] But this plea largely fell on deaf ears from 2004 through 2015. There were rare exceptions: one was the Case Method Project funded by the Marine Corps Foundation and led by Bruce Gudmundsson, a retired Marine major and professor of military history at the U.S. Army War College, with the assistance of Damien O'Connell.[92] The Case Method Project utilized decision-forcing cases (DFCs) to improve decision making across ranks. Several Marine Corps training and education entities adopted the DFCs so produced, including Enlisted Professional Military Education, The Basic School, and the Infantry Officer Course.[93] However, the majority of the Marine Corps lacked even these limited touchpoints with the critical thinking framework offered by wargaming.

This trend would not change until 2015, as the Corps drew down its presence in Iraq and Afghanistan, and concurrently several wargaming initiatives at Marine PME institutions stepped forward. The Marine Corps War College (MCWAR) emerged as an epicenter of educational gaming. In 2015, MCWAR began using *Darkest Hour*, a digital wargame focusing on statesmanship and theater-level military operations.[94] Dr. James Lacey, a professor of strategic studies at MCWAR, augmented this with several commercial wargames in his courses. Titles like *Diplomacy*, *Polis*, *Paths of Glory*, and the Next War series gave a renewed demonstration to senior Marine leaders of wargaming's value as a powerful experiential learning tool.[95] Marines were also taking stock of the continued advances in computer-based games—cloud-based communities like Steam, and highly detailed, real-time games like *Command: Modern Operations,* both offered opportunities for larger audiences to play each other simultaneously and a vastly more diverse array of weapons, systems, and scenarios than were available in the time of *Close Combat Marine.* A few educators even whispered about reviving the concept of a Commandant's Wargaming List.[96] As 2020 approached, the wargaming pendulum in the Marine Corps was swinging upward from its nadir once again.

A Promising Renaissance

After nearly two decades of relative neglect, the Corps is seeing a promising renaissance in educational wargaming. The watershed came from the 2019 *Commandant's Planning Guidance* (CPG) issued by General David Berger. General Berger identified an ominous gap "in the training and education of our leaders: practice in decision-making against a thinking enemy."[97] He then noted that "wargaming historically was invented to fill this gap, and we need to make far more aggressive use of it at all levels of training and education to give leaders the

necessary 'reps and sets' in realistic combat decision-making."[98] As with General Charles Krulak's efforts in 1997, wargaming in the Corps again had an official mandate at the highest level; and with the concurrent improvements in both digital and analog wargaming in the decades between the two commandants, Berger's directive both unleashed new initiatives and energized existing efforts.[99]

Given Berger's mandate, Marine Corps University (MCU) developed its own aggressive plan to create new educational wargaming opportunities and expand those that already existed in its curricula. MCWAR's games grew more robust and frequent in the years immediately following the release of the CPG. Dr. Lacey created an expansive global wargame campaign by linking together several titles from the Next War series to challenge students with simultaneous crises in eastern Europe, Taiwan, and the Korean Peninsula.[100] In 2021, another MCWAR professor, Colonel Brian W. Cole, leveraged Rand's *Hedgemony* wargame in his Joint warfare course. *Hedgemony* examines long-term strategic planning, force planning, management, and posture.[101]

Outside of formal PME curricula, MCU also created a force multiplier for educational wargaming with the chartering of the Brute Krulak Center for Innovation and Future Warfare in 2018. Granted an expansive mandate by the president of MCU for inculcating innovative approaches to problem-solving and critical thinking across MCU's schools, the Krulak Center both supported extant wargaming inside the schools and developed its own programs. This support took many different forms: supplying personnel to help facilitate school-led games, building its own library of computer and tabletop games available to all students, running an annual cross-school wargaming tournament, and creating a web-based wargaming resource page on MCU's PME portal The Landing.[102] One of the most fruitful supporting efforts under the aegis of the center was its Non-Resident Fellow program, which recruited several fellows with backgrounds in different types of wargaming. The network of fellows led to additional external partnerships, such as regular collaboration with the Georgetown University Wargaming Society (GUWS).[103] Among the center's many joint activities with GUWS was a unique open house/faculty development event in 2019. Georgetown graduate students brought original games created for a wargame design course taught by Sebastian J. Bae to the center, allowing MCU students, faculty, and staff to play them while learning more about wargame design and execution. This cross-pollination of wargaming initiatives executed at PME and civilian universities opened new possibilities for institutionalizing educational wargaming in unique ways across the Marine Corps.[104]

The nexus between the Krulak Center, GUWS, and Bae—a Non-Resident Fellow at the center—also bore fruit in the creation of a unique tactical-level educational game based on the emergent Marine Littoral Regiment (MLR) construct.[105] Entitled *Fleet Marine Force* (*FMF*) and set in the Indo-Pacific re-

Figure 8. Georgetown students conducting their original wargame, *Hellenic Struggle*, for MCU students at the Krulak Center

Source: photo courtesy Sebastian J. Bae.

gion, *FMF* allowed 2–10 players to explore future operating concepts, nascent technologies, and all-domain warfare. Customizable and intuitive, *FMF* is simple enough to learn the basics in half an hour, but it presents players with challenges in combat, concealment and signature management, logistics, and a vast array of Joint—and adversary—capabilities that Marine leaders can expect to encounter on future battlefields under the *Force Design 2030* and *Expeditionary Advanced Base Operations* concept.[106] In March 2021, *FMF* served as the capstone wargame for Expeditionary Warfare School (EWS). For two full days, all of the school's 16 conference groups sought to outthink, outmaneuver, outfight, and deceive that "thinking enemy"—in this case, their fellow students. As of 2021, a virtual version is available on *Tabletop Simulator* upon request and a small batch of print copies are currently being produced for select Marine Corps units.

The Corps has also devoted considerable effort in recent years to crafting its own original wargames again in the vein of the TACWAR series. In 2019, the Wargaming Division (WGD) of the Marine Corps Warfighting Lab, overseen by its then-director Colonel Tim Barrick, designed the Operational Wargame System (OWS), initially focused on future conflict in the Indo-Pacific theater. It was the WGD's goal to offer the OWS as a prolific and standardized wargaming system across the Corps.[107] *Assassin's Mace*—the first module of the OWS—is

Figure 9. EWS students playing *FMF* during a two-day capstone wargame

Source: photo courtesy Sebastian J. Bae.

a tabletop manual wargame in which players execute the operational art and Joint warfare across domains. The tabletop version was soon joined by a pilot VASSAL module in 2020, bringing the game to a wider Marine audience and enabling distributed gameplay; the latter feature proved unexpectedly useful as the COVID-19 pandemic caused significant disruption to normal PME routines later that year. In early 2021, the WGD prototyped a European module for the OWS called *Zapad* and has plans for additional theater-specific expansions. *Assassin's Mace* has been used not only in Marine Corps PME schools but in the PME institutions of other Services and in civilian universities as well—Marine Corps Command and Staff College, the School of Advanced Warfighting, the U.S. Army's Command and General Staff College, the Naval Academy, and Georgetown University have all implemented the game in their curricula.

Perhaps the most promising trend of this wargaming renaissance is that, despite the space devoted to it here, educational wargaming is blossoming across the force. A much more detailed rundown on MCU gaming efforts was recently published in the *Marine Corps Gazette*.[108] As noted above and in a recent article by Sebastian J. Bae and Major Paul M. Kearney, select operational Marine Corps units are exposing their Marines to wargaming, ranging from *FMF* to the simple commercial titles like *Memoir '44*; even the Corps' Recruiting Command is exploring the inherently competitive nature of wargames as a vector for recruit-

Figure 10. Midshipmen at the U.S. Naval Academy playing *Assassin's Mace* to enhance professional development

Source: photo courtesy Sebastian J. Bae.

ment.[109] Thus, the question today is not whether or not there is a resurgence in educational wargaming across the Marine Corps—it is there, and growing. The real question is whether this resurgence proves as transient as its predecessors or endures longer than the presence of a few individuals devoting their personal energy to the cause. The final section of this article offers several recommendations in this vein to finally fulfill, throughout the Corps, the promise of educational wargaming; in the words of MCU's Krulak Center, to "make it stick."[110]

Recommendations

A common theme through this article is that a one-size-fits-all approach is often the death knell of cultivating longevity; thus, the authors will not propose a single silver bullet but offer recommendations culled from the near-century of Corps history through which educational wargaming has ebbed and flowed. Taken together and tailored as necessary for the various training, education, and operational needs, the authors believe that the history bears out the value of these recommendations in establishing a lasting and robust culture of wargaming.

Balance fidelity and playability: whether in the case of the *Educational War Game*, *TACWAR*, or MTWS, the wargames formally developed by the

Marine Corps succumbed, time after time, to a mission creep that conflated realism with complexity. The desire to add more layers, more mechanics, or more rules to a gaming framework due to a perceived need to make it more realistic almost always caused Marines to stop playing the game. A hyper-realistic game that ends up stacked unused in warehouses, as *TACWAR* ultimately did, is valuable to no one. Marine organizations charged with training, educating, and otherwise preparing Marines for operational challenges must accept that even the most realistic wargame necessarily abstracts elements of gameplay. Those organizations must also understand that there is nothing wrong with this, and indeed, there is not a single training event conducted by Marines that does not abstract some element of the exercise. Abstraction is what allows the training or educational event to focus on the critical learning outcomes. The ultimate goal of wargaming—or any training or educational activity—is to give Marines the opportunity to learn, fail, adapt, and try again the desired skill in an environment where such failures do not cost materiel or blood. If a particular decision-making challenge is not adequately captured in a particular wargame, the automatic response should not be to attempt to make the wargame do something it was not designed to do. Find another wargame or decision-making tool or look to a different educational mechanic entirely. However, turning a game designed to provide a specific challenge into a bloated mess that models many challenges but gathers dust in a warehouse does nothing to close the decision-making gap identified by General Berger.

Use a family of games, rather than "one game to rule them all": in the spirit of the recommendation above, those times in the Corps' history when educational wargaming was at its most vibrant were the times when a myriad of different titles, or even gaming platforms, were used for specific objectives. The golden age of Marine Corps wargaming saw a vastly diverse library of games employed, with Marines gravitating toward different gaming titles and platforms as their unique learning requirements demanded. TDGs filled the gap in some instances, *Advanced Squad Leader* in others; and it was this cultural environment of intellectual flexibility and adaptability that allowed the golden age to flourish as long as it did. In reviewing the most recent history of educational wargaming, one thing that should have struck the reader was how many different gaming variations were present. EWS used one game, CSC another, and MCWAR a third—and this is entirely appropriate given the variance in operational perspective present at each school. This ties back to the acceptance of abstraction as well. A captain gaining exposure to the all-domain complexities of modern company command represented in *FMF* at EWS does not also need to consider the five-year investment strategies that the lieutenant colonel at MCWAR must consider in *Hedgemony*. What matters is the opportunity to practice decision making and critical thinking against another human adver-

sary operating under the same rules in the same synthetic environment. Just as a Marine leader will grow their professional knowledge in a PME continuum tailored to their level of responsibility throughout their career, so too must the Corps' training and educational entities accept a similar continuum of decision-making opportunities, tailored to responsibility, offered by a wargaming continuum that uses different games for different challenges to critical thinking.

Connect the islands of excellence to each other: one of the starkest lessons from the Corps' history of wargaming is that such a continuum mentioned above has never existed. Enthusiastic islands of excellence might grow where one motivated individual, or a robust organizational culture, provided exposure to decision-making opportunities through wargaming to a small population of Marines. But even in the golden age, a Marine could step away from one of those islands and never again experience a wargaming touchpoint. A game like the LFDG could exist but stay tucked away in a small corner of the institution with no opportunity to reach a wider audience. Conversely, a senior leader like General Krulak might issue an order that nominally impacted the whole of the institution, but not have the time to create the corresponding enforcement mechanics needed to make that order stick beyond his tenure in office. Like a carnival whack-a-mole game, for more than a century wargaming islands have popped up only to vanish because they could not support each other. Those islands need reinforcement at all levels, so that a culture of educational wargaming might endure and correct the decision-making deficit identified by General Berger. There exists a unique opportunity in the Corps today where multiple islands exist, from the *Commandant's Planning Guidance* down through massed educational efforts at MCU, and in those individual FMF units whose commanders are willing to carve out the time to create decision-making spaces for their Marines with stand-alone wargaming programs. These islands should not wait for a formal multiyear plan, with attendant funds, personnel, and formal bureaucratic changes to make cross-institutional wargaming "official." Marines are known for their initiative; with so many islands implementing their own wargaming efforts today, the leaders on those islands must connect with each other now to make the gaming culture maintain staying power and let the paperwork trail catch up when it can.

Do not let resourcing be an excuse: not a Service under the Department of Defense stands unthreatened by shrinking budgets. COVID-19, the drawdown in Afghanistan, and a host of other factors all feed into the new reality that our armed forces do not have as much money to work with as they did in previous decades. When it comes to wargaming, however, money should not be the excuse to stand idle. In contrast to long-range fire support platforms or fifth-generation aircraft, wargames are a bargain. Most current computer or tabletop titles cost less than $100; many classic titles can be found through third-party

marketplaces for a fraction of that price tag. Once acquired, the only other cost incurred by wargaming is time. The authors freely admit that this cost is not inconsequential. It is a truism that even basic unit annual training requirements eat up almost more training hours than are available in a calendar year, and that is before one counts operational training and readiness manual requirements. Even a simple wargame takes a few hours and a few repetitions for a facilitator to learn, and that time must come from somewhere. However, the relatively low material requirements for conducting a wargame arguably create their own opportunities. One does not need a training range, safety officer, ammunition, fuel, chow, or air support to conduct a wargame that nevertheless models fire, maneuver, and logistical challenges. Moreover, a few hours carved from a training schedule for wargaming may provide more decision making and critical thinking reps and sets overall, for a much larger pool of Marines who need it, than several days of live training wherein a Marine might get only one repetition in the event. All told, wargaming can fulfill vital learning outcomes for a fraction of the time and money needed to replicate a similar outcome in the real world.

Leverage the Marine: a preponderance of the examples highlighted throughout this article are not the result of the institutional Marine Corps getting it right, but of individual Marines offering their own talents and time to capitalize on the promise of wargames. In some cases, this individual initiative was actively cultivated by higher authority; in others, the Marine might have had no support but was sufficiently convinced of the need to help their peers increase their capacity for decision making and critical thinking that they did it on their own anyway. The point from both cases is that talented wargamers exist in the Marine Corps who only need to be given the opportunity to share that talent, and they will carry the effort forward themselves. In those organizations where a culture of wargaming is already growing, the leaders there should leverage those Marines as part of their broader approach to implementing wargames as an instructional tool. If an organization has no preexisting culture or is afraid to take the first steps to start one lest a failed attempt strangle the project in the cradle—ask those organic wargamers for help. Leaders may not know they exist, but they do and will gladly manifest themselves when asked. Moreover, another common thread through the history just described is that when given the opportunity to facilitate wargaming, the Marines given that responsibility will pour themselves into that effort. They will not count the hours needed to prepare or facilitate or clean up—they are inflamed with the passion that comes from believing in the value of something and only want to be given the chance to demonstrate that value. Let them; those Marines will prove infinitely more useful than an unlimited budget or training white space.

Do it more than once, and do it with everyone: General Berger's com-

ment on "reps and sets" ties back to a key part of what made the Naval War College's wargames so valuable in the interwar years. To paraphrase both Admirals Sims and Nimitz, the value came from the game's constant iterations throughout the students' course of study, with wargame scenarios run week after week and under a variety of different conditions. Leaders can only hone decision-making skills for future wars when they are given repeated opportunities to make, and learn from, decisions. Moreover, wargaming's full value for the operating forces comes from giving as many Marines as possible as many opportunities as possible to sharpen their critical thinking. Another key takeaway from the Naval War College example is that the wargame was not reserved for a handful of wise old admirals, but it involved officers who would later command at all levels, from individual ships to carrier task forces to fleets flung across the vast expanse of the Pacific. The Navy had far more lower-level tactical commanders than admirals ensconced in Pearl Harbor or Washington, DC; those commanders were the ones who would be directly engaging the enemy, and who needed the decision-making skills to strike and counter Japanese actions far from the ability of fleet admirals to sway battles one way or the other. They were the real beneficiaries of the Naval War College wargaming program, and so the Marine Corps should keep that in mind as it seeks to rekindle its own wargaming renaissance. Service-level wargames executed every one to two years for a senior audience may have a value for that audience; but that is a far cry from reps and sets conducted week after week by those tactical and operational leaders whose decision making will be the most challenged in any future conflict. Decision-making skills held only by a select few, and tested on only a yearly basis, are the antithesis of the model developed at the Naval War College. Wargaming's value truly comes from activities done time after time, under different conditions, with the broadest audience possible

If the Marine Corps is to capitalize on this latest renaissance in educational wargaming—to actively help it endure and not ebb away in the space of a few years, as did the transient golden ages of the past—the Service should embrace the bold actions recommended above and in the many past pages written on the subject, and value, of wargaming. These recommendations are informed by the few successes and larger number of failures and unfulfilled promises of the Corps' history of wargaming. Moreover, as noted in the authors' final recommendation, the most important raw material—the energetic and thinking Marine—is available in abundance. The Corps abounds with thousands upon thousands of "frisky" Marines cut from the cloth of Earl Ellis: competitive, intellectually engaged, and open both to trying and mastering new tools that help them excel in their trade of warfare. Across the many pages just presented to the reader, one recurrent theme is that Marines are ready and eager to do this, and even if the wargaming opportunity given them is only on a small island of

excellence, or supported with the most marginal of resources, they will exploit wargaming's promise to the utmost. And that promise is as a training tool for the deadly serious mission of winning their nation's wars that every Marine is called to fulfill.

Skeptics should not be distracted by the "game" verbiage of wargaming. While they can be entertaining, the point of the wargame is war—its study, practice, the preparation needed to face its challenge, and most importantly, developing the decision-making and critical thinking habits needed to face human adversaries who are equally determined to out-decide and out-think us. In future conflicts, against adversaries who have closed the gap of materiel and technological advantage long enjoyed by the armed forces of the United States, such mental habits may be one of the few remaining places America's men and women in uniform can gain a decisive edge. In the succinct words of Major Frederic Green in 1964, "Tomorrow's Marine may fight a better war, thanks to the War Game of today."[111] Wargames are an arena in which Marine leaders of all ranks can develop those habits and do so without the cost of lives or irretrievable defeat. Cardboard counters do not bleed, and a loss within a wargame is neither fatal nor final. It is far better for leaders to make mistakes, fail, learn, and build their critical thinking habits in that environment, over and over again, rather than have those first failures and defeats come against a real opponent and with no opportunity to reset the game board.

Endnotes

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78. Walters interview.
79. William D. Brobst and Alan C. Brown, *Integrating Wargaming into the NMITC Curriculum: TacOps Demo* (Alexandria, VA: Center for Naval Analyses, 2000), 9.
80. The key instructors involved with the pilot of *TacOps* at NMITC were then-LtCol Eric Walters, Capt Brian Rideout, and Capt Brian Gillman. Walters and Gillman retired from the Marine Corps as colonels. Col Brian Rideout remains on active duty; and Walters interview. Another adaption of *TacOps,* called *TacOps Cavalry,* would be used by Col John Antal at the U.S. Army Armor School at Fort Knox, KY.
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82. For more information on *InfoChess*, refer to "InfoChess," Global ECCO. InfoChess remains in use today at the Naval Postgraduate School, Monterey, CA; and Walters interview.
83. Caffrey, *On Wargaming*, 179–80, 193–96. Throughout the 1990s, the Marine Corps conducted a de facto Title 10 wargame called *Urban Warrior*. And although the decision to revive the Service's Title 10 wargame preceded events on 11 September, the GWOT provided renewed vigor to the initiative. For more information on Title 10 wargaming in the Marine Corps, refer to Caffrey, *On Wargaming*; and Taylor Teaford, "The 2015 Wargaming Program," *Marine Corps Gazette* 100, no. 2 (February 2016): 14–17.

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87. Caffrey, *On Wargaming*, 195. According to McBreen, the 2004 workbook is based on his previous 2002 workbook, which has an earlier *Gazette* article focused primarily on the commercial version of *Close Combat*. Both the 2002 workbook and 2000 article in the foreword would be adapted for the 2004 workbook and *Gazette* article for the official release of *Close Combat Marine*. Brenden B. McBreen, email message to author, 13 May 2021; and Capt Brendan B. McBreen, "I Want to be 'Ender'," *Marine Corps Gazette* 82, no. 4 (April 1998): 46–48.
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103. For more information on GUWS, see "Georgetown University Wargaming Society (GUWS)," guwargaming.org.
104. Under Dr. Benjamin Jensen, there was a brief effort in establishing and conducting a

TECOM Warfighting Club, which had a focus on educational wargaming. However, the club did not endure due to various mitigating factors like COVID-19. However, it did inspire similar "Fight Club" initiatives, including the expansive UK Fight Club. For more, refer to Benjamin Jensen, "TECOM Warfighting Club," *Marine Corps Gazette* 103, no. 6 (June 2019): 8–10.

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Wargaming in Professional Military Education
Challenges and Solutions

Colonel Eric M. Walters, USMC (Ret)

Abstract: Given the emphasis to employ wargaming in professional military education, how can instructors in the schoolhouses, operating forces, and supporting establishment—particularly those who are not experienced wargamers themselves—go about it? This article explains the necessity of crafting desired learning outcomes to selected, modified, or in-house designed serious wargames with the assistance of accomplished experts. Summarizing relevant recent scholarship, it provides foundational terminology and concepts that facilitate collaborative conversations, as well as offers advice regarding common but avoidable pitfalls of this dynamic and immersive teaching method.

Keywords: professional military education, PME, serious games, serious wargames, educational games, role-playing games, matrix games, solitaire wargames

Commercial wargaming was—and arguably still is—a niche hobby for those who look at wargaming as more than merely an entertaining diversion; during its history in the twentieth and early twenty-first centuries, only a relatively small proportion of military members and academics regularly played what have been termed as serious wargames.[1] In the past, there was insti-

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tutional resistance to the idea of using what some felt to be children's games in professional military education (PME); while that stigma has lessened recently, the learning barriers for wargames nevertheless remain high for the uninitiated.[2] The games can be hard to learn and even more difficult to win against a competent opponent.[3] Yet, here we are in 2021; military wargaming appears to be undergoing a resurrection in PME schools, the operating forces, and even the supporting establishment. Commandant of the Marine Corps General David H. Berger in his *Commandant's Planning Guidance* emphasizes the need for practicing military decision making in PME, which is the primary purpose of educational wargaming.[4] But one fact remains; for those who are interested in using and designing wargames to teach military judgment, this teaching method can seem too difficult to implement effectively.[5] The success stories in academia involve professors, instructors, and Marine leaders in the operating forces who already are wargamers.[6] How does someone who is not a wargamer but teaches military decision making figure out what wargame to use? How does one use it? What are the advantages and limitations of the various games available? What are the challenges in integrating wargames and curriculum, and how can these be overcome? This article intends to help orient those unfamiliar with wargaming and advise on proven best practices in using them when teaching military judgment in decision making.

Overcoming Past Legacies

Even in its modern beginnings in Prussia, wargaming—as it emerged from abstract predecessors into more realistic depictions of combat—was not always a very popular teaching method within the military education establishment.[7] While the Prussian chief of staff, General Karl von Müffling, had initially been against the idea, he was subsequently won over after witnessing an 1824 kriegspiel demonstration by Lieutenant Georg von Reisswitz. "It's not a game at all, it's training for war. I shall recommend it to the whole army," the grizzled Prussian veteran of the Napoleonic Wars had exclaimed during von Reisswitz's display.[8] This young wargaming advocate was nevertheless subsequently ostracized by his colleagues and committed suicide three years after his game's endorsement.[9] Some officers nevertheless saw the utility of wargaming in education in decision making; one of the earliest adherents was a certain Lieutenant Helmuth von Moltke (later labeled "the Elder"), who advocated using Reisswitz's game just a year later. Once made chief of staff of the Prussian Army, von Moltke the Elder mandated wargaming as a part of a candidate officer's academic preparation to become a member of the General Staff.[10]

Fast forward to 12 April 1997, the date of *Marine Corps Order (MCO) 1500.55, Military Thinking and Decision Making Exercises*, signed by then-Commandant of the Marine Corps, General Charles C. Krulak.[11] While there

were some tentative efforts to implement wargaming in the Marine Corps, none endured as a favored tool in professional military education for any meaningful length of time. There were isolated instances of force-on-force wargaming used in education here and there but nothing that was institutionalized across the Marine Corps.[12] The closest method and the most often employed decision game teaching technique was, first and foremost, the tactical decision game (TDG). TDGs were easy to implement and well-supported in the pages of the *Marine Corps Gazette*.[13] While the Marine Corps Association bookstore in Quantico stocked commercial wargames next to the books listed in the Commandant's Professional Reading List, they eventually dwindled and disappeared altogether when the Avalon Hill Game Company and its subsidiary, Victory Games Company, went out of business.[14]

How Does the Educator Use the Game to Teach the Students?

As with selecting any specific teaching method, knowing what the educational outcome the wargame is meant to serve at the outset is foundational:

> Wargames have . . . educational advantages for the study of war, because students must grapple with real strategic and tactical dilemmas as they struggle to beat their colleagues, and because the games show that the historical outcome of a conflict was not bound to occur. . . . As with any teaching method, the first priority when deciding to employ a wargame in class is to have a clear sense of the educational objective.[15]

This looks like a "Master of the Obvious" exhortation, but professional wargamers used to translating objectives into game design will say that it is not hard to give a wargame user what they want, but much more challenging to give them what they really need, especially if the user cannot verbalize the latter. It is best to pair the educator with a serious wargame expert to decide what kind of game is going to work in meeting the learning outcomes. Frequently, it means the learning objectives—those brief outcome statements that describe the measurable observables of knowledge, skills, and attitudes the student should exhibit—must be articulated with far more precision. This is also true when custom designing a wargame to fit an educational requirement when an existing commercial game cannot be found that suffices for the expected learning outcome.[16]

Of course, if faculty members are not familiar with serious wargames, it is hard to know what learning outcomes are best suited for educational wargame application. An educator teaching tactics might want their students to know the eight ways to gain advantage, per *Tactics*, Marine Corps Doctrinal Publication

(MCDP) 1-3.[17] But the wargamer-educator is likely to ask if being able to describe these ways is enough. Might it be better if the student can demonstrate at least a proportion of them on a wargame board and provide a rationale that manifests a correct understanding of the concepts? The former objective might read something like "the student can describe, orally or in writing, all eight ways to gain battlefield advantage, in accordance with *Tactics*, MCDP 1-3." But if the educational intention is that students should develop and practice military decision-making skills in applying this knowledge, another learning outcome can be added: "Provided a scenario in a tactical-level wargame, the student can demonstrate—through his game moves—and justify at least four of the eight ways to gain battlefield advantage, in accordance with *Tactics*, MCDP 1-3." What remains is selecting the game that best supports this latter outcome, given the constraints of the facility resources and time available. Given the historical cases provided in this particular doctrinal publication, it might be best to select a wargame that covers one of them, such as the Gettysburg example, using a very simple title by veteran game designer Mark Herman, *Gettysburg Deluxe Edition*.[18]

Dr. Philip Sabin, former professor of War Studies at King's College London, who specializes in employing wargaming in military history and theory classes, suggests the below categories of learning outcomes best suited for educational wargaming.[19]

Understand Relationships between Force, Space, and Time in Tactics, Operations, and Strategy

Novices in military judgment at any level of war do not immediately appreciate the potentials, implications, and consequences in employing a particular force array within a particular battlespace, either for their own side or their adversary.[20] In this author's implementation of the Fort Lee Satellite Campus Command and General Staff College-developed game, *Baltic Reign*, student officers performing course of action (COA) analysis were surprised by the problems involving "the tyranny of distance" in deploying forces and sustainment to Eastern Europe, particularly when pressured to simultaneously win battles at the adversary's geographical doorstep at the outset of operations.[21] Deciding when, where, and why to offer battle—and when, where, and why to refuse it—is the very essence of operational-level decision making.[22] In games, the students were usually eager to rush to failure—aiming to win initial battles—but getting themselves into an operational-level catastrophe as they could not sustain a string of tactical victories for long. Much depends not only on the present ratio of forces on the map but also the potential power correlation over time in key geographic areas, depending on various assumptions. Forcing the students to face such difficult decisions and accommodating the consequences—not only

the near-term ones but also the mid-term and long-term—is a large part of what they need to learn.

Likewise in the U.S. Army Command and General Staff College elective A681 History in Action, the author and the Fort Lee Satellite Campus military history professor employed simulation support from the Fort Leavenworth staff at the college, running the simple board game *Battle for Moscow* via a popular online computer program, VASSAL.[23] The overall educational intent of the course is to place students into historical situations where they must analyze problems and make military decisions. Through this method, they then can better understand and evaluate the decisions the historical commanders made. The curriculum is completely decision-game centered and employs wargames so that students must determine pertinent objectives, develop COAs, and evaluate their execution of the COA employed, considering the consequences that occurred in the game. Army officer students are directed to assess their plan and/or execution through the lens of the nine principles of war.[24] Certain principles, such as mass and economy of force, compel students to evaluate how well they balanced the correlation of forces against their formulated objectives—to include the enemy's as well as their own—given the time limit of seven turns to win. Both players must judge their performance in applying maneuver and achieving surprise or—frequently—how they ended up as the target of the same! Timing offensive action, metering the tempo of the advance, and knowing when to resist the temptation to attack are also major considerations. However, *Battle for Moscow* does not support analysis of the principle of unity of command, given that there is only one player per side. Despite this, the involved staff of the U.S. Army Command and General Staff College think the advantages the game offers outweigh its disadvantages.

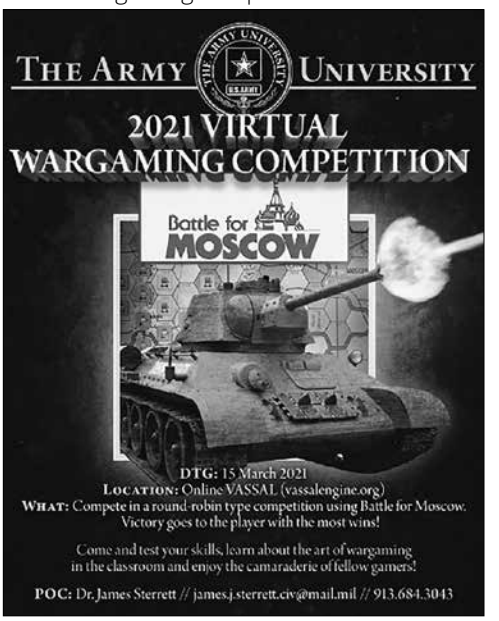
Even with the preliminary readings describing the course of the campaign, students often remark how playing the game better illustrates the difficult decisions regarding sufficient force allocation to accomplish various competing geographic objectives, given the tight time constraints that their historical counterparts faced. They also learn that while the principles of war can be useful in providing an analytical lens and common lexicon to evaluate their performance and the opponent's performance, they are extremely difficult to employ prescriptively in formulating and executing a COA.

Working through Dilemmas in Decision Making within a Realistic "Decision Environment" Simulated in the Wargame

Dr. James Lacey described how senior field grade officers at Marine Corps War College grappled with the issues of formulating and implementing strategy in a commercial-off-the-shelf wargame, exposed to thorny problems they never had previously experienced at the national strategic level.[25] He employed a popular

strategic wargame, entitled *Triumph and Tragedy*, covering the later interwar period and continuing on through the entire course of World War II in Europe.[26] He based his selection on the game's portrayal of the economic and diplomatic instruments of national strategic power, not just the military instrument. Placing the students in the roles of the United Kingdom and United States negotiating teams at the 1943 Casablanca Conference, they had to settle disagreements on strategic priorities and execute their decisions on the game board, which forced them to accept the resulting consequences.[27]

Figure 1. Army University's *Battle for Moscow* online wargaming competition



Source: U.S. Army Command and General Staff College, courtesy Dr. James Sterrett.

Experiencing the Interactive Dynamics of Friction, Uncertainty, Fluidity, Disorder, and Complexity in the Wargame Environment

This accords well with *Warfighting*, MCDP 1's characterization in chapter 1 on the nature of war and warfare.[28] Some games do this better than others as published, but any of them can incorporate these factors with minor modification. Popular methods include techniques to simulate limited intelligence through hidden units for both sides, either using pieces "face down" until revealed by scouting or combat, or in a "double-blind" session with an umpire adjudicating reconnaissance and surveillance reporting prior to and when in contact. Others incorporate variable movement ranges in difficult terrain and/or bad weather, delays or outages in unit communications, or random event/SNAFU effects using die rolls and/or cards.[29] Commercial tactical-level games often include ratings for unit and individual leader morale and tactical proficiency to discriminate between elite and conscript formation quality to crudely simulate the effect of fear when fighting battles, inexperienced formations either melting away more quickly or retreating more frequently.[30]

The author ran several double-blind wargames using a very complex but popular system with his officers, customized in such a way that the situation would challenge their initial assumptions about the situation and encourage creative adaptation in execution to achieve the overall commander's intent.[31]

Figure 2. Wargaming Week 2019: student-led wargaming at the Naval Postgraduate School

Source: "Student-led Wargaming Offers Insights, Analyses into Future Conflict," Naval Postgraduate School, 5 August 2019.

The author would only teach the minimum of information for the participants to make basic decisions; these were then translated into game actions conforming to the rules. This particular game system facilitated not only a great deal of uncertainty with its rules for hidden (not seen on the board) units, concealed units (location of units seen on the board but not their composition), but also very high friction levels as weapons and radios malfunctioned, artillery rounds fell short, vehicles bogged down in difficult terrain, inadvertent fires raged given the right weather conditions and combustible terrain, stout units unexpectedly panicked under fire and green units surprisingly stood fast or rallied quicker than normal, units ran out of crucial ammunition when most inconvenient, and more. Repeated practice with the game inoculated the participants against expectations of perfectly executed plans, teaching them flexibility, adaptability, focus, and perseverance.

Exercising Creative and Critical Thinking Preparing for, Participating in, and Analyzing the Wargaming Event

Wargame participants find themselves confronted with their unintentional analytical biases in understanding and communicating their estimates, their arguments compromised by faulty reasoning most typically through logical fallacies.[32] Wargaming quickly spotlights these problems in the public glare of examination by one's colleagues. The incentive to improve both one's thinking and the ability to communicate ideas effectively is irresistible. Dr. Lacey has

written about how often war colleges talk about improving the critical and creative thinking skills of their students but rarely give those same students practice in them. For him, wargaming is the best environment to remedy this deficiency.[33]

As one example of this in the U.S. Army Command and Staff College A681 History in Action elective wargame, *Battle for Moscow*, students will take the initial disposition of German forces as a given and press against the Soviet defenses in both the north and the south of the game map, following the same concepts the Germans did historically. This example of anchoring bias comes naturally to new wargamers, as they are unsure of what to do differently and cannot judge the prospects for success given a different concept of operations. The problem is that the northern approach—while the shorter road to Moscow—is also the most heavily forested and fortified, enhancing Soviet defenses there. Some students decide to make the main effort in the south, where the path to victory may be the longest, but the terrain appears more suitable for a rapid mechanized advance. In the post-game after action review sessions the author facilitates, it is illuminating for the students to compare notes on the decision whether to equally weight the northern and southern advances, or to put all the mechanized forces in the south. We then compare these judgments to those of the historical commanders to understand why they did what they did. The additional historical context usually leads to discussions about the limitations of the game in replicating the environment. In this case, the severe difficulties the Germans had with sustaining their forces at this point in the campaign and the need to attack quickly after liquidating the Kiev pocket meant the Germans could not combine their two offensive prongs in the south.

Students thus get the benefit of practicing both creative thinking (e.g., doing something new that was not done historically) and critical thinking (e.g., understanding why that novel concept was not done in reality). These kinds of discussions usually lead to observations on what the game simulates well and—equally important—what it does not. Students then better understand George Box's famous warning, "All models are wrong, some are useful."[34]

What Type of Wargame Works Best for the Learning Objectives?

Once the learning outcomes that wargaming can support are clearly stated, what kinds of games are most suitable for them? As Sebastian Bae and Major Ian Brown argue in their "Promise Unfulfilled: A Brief History of Educational Wargaming in the Marine Corps," there can be no single wargame that meets all potential academic requirements.[35] So educators have to be willing to compromise at some point, and determining just what things are absolutely necessary and what things are adjustable is part of the process in selecting a wargame to

Figure 3. 3d Marine Division *Memoir '44* wargame competitions

Source: official U.S. Marine Corps photo by Cpl Timothy Hernandez.

accomplish the learning objectives.[36] Here are descriptions of general types of wargames that can help educators decide whether or not a particular title will fit their specific learning outcomes and faculty/classroom facilities.

Role-playing Games (RPGs)

This is the most common way to translate tactical decision game (TDG) participant solutions into actual practice, through playing out a selected participant tactical order. The selected solution author becomes the overall unit commander, with other participants assigned roles as subordinate leaders, key staff, and even as partner forces or neutral actors.[37] The facilitator takes on the role of the adversary and guides the other participants along by describing what they sense as the order is executed on a map sketch. It is not uncommon for the facilitator to "kill" or otherwise incapacitate role-playing participants to complicate the situation, immediately assigning them other roles in the game.[38] Experienced facilitators have an adversary plan they use to guide their narrative story line; this they keep secret from the participants until the end, revealing it in the after-action critique.

The primary advantage to this technique is the relatively small facilitator preparation, overhead, and facility requirements compared to other wargaming methods. It does a great job allowing for high levels of uncertainty, replicating disorder and friction, as well as fluidity and complexity, with a minimum

Figure 4. Naval Postgraduate Students enrolled in the Wargaming Applications Course execute strategies designed and developed in their 11-week class

Source: official U.S. Marine Corps photo by Javier Chagoya.

of fuss. This type of game works best to simulate tactical-level scenarios. Instructors less confident of their ability to adjudicate combats can use various methods to generate random outcomes using cards or dice, as often used in commercially published role-playing games.

Some might quibble that because there are not two forces involved in free play—the facilitator is acting as the adversary instead of another player—that RPGs are not representative of a truly force-on-force wargame. There are perceptions that this approach is nothing more than the kind of experience *Dungeons and Dragons* (*D&D*) is, a fantasy game with players acting as an adventuring party and the facilitator as the "Dungeon Master." For those who might be dismissive of this particular technique because of these perceptions, it must be said that the participant role-playing and game master approach adopted by the designer of D&D, Gary Gygax, was inspired by U.S. Army Captain Farrand Sayre, who described referee-controlled adversaries in games to test execution of tactical plans in the early 1900s.[39]

Seminar Matrix Games

This technique, developed by Chris Engle, adapted the RPG idea to examine strategic challenges in complex environments.[40] It also involves a facili-

Figure 5. Naval Postgraduate School students participate in analytic wargames they designed

Source: official U.S. Marine Corps photo by Javier Chagoya.

tator, acting as an umpire or referee. Unlike RPGs, however, the players are not necessarily members of the same side executing at the tactical level. In matrix games, participants are separately competing (and/or sometimes cooperating) entities or actors, interacting in different ways depending on the circumstances—conflicting with other players on some occasions, standing aside in others, or making pacts to defeat a common enemy or working together to solve a common problem. While this type of wargame can simulate a complex tactical situation involving at least two sides (and often more), they are most successful simulating strategic and operational-level situations. Participants are national leaders, senior commanders, and other high-level influencers; some may oppose each other actively, some more passively, others may be neutral at the start.[41]

All participants are given a scenario to study and prepare for their decision making in the game; once the game begins, player decisions are submitted in a series of moves framed as arguments. These arguments propose a claim, specifying an action and outcome, with three reasons why the outcome would occur as a result of their action. For every move in the matrix game, each participant writes up the argument secretly. Deciding whether or not to share the actual claim and reasons (or fake ones) with partners, adversaries, or neutrals before-

hand is part of the game, crudely simulating information operations. All the arguments are collected up for that move and then adjudicated by the referee. Arguments that contradict each other are negated and the rest adjudicated, based on their internal logic in the face of competing lines of reasoning. The referee announces the outcome and the next move occurs. As much or as little time can be given for the players to interact with each other, to do a little bit of research, and to write up their move; it depends on the goals for the game and the amount of time needed to achieve them. As with the RPGs, cards or dice are frequently used to adjudicate various events when a stochastic element is necessary.[42]

The open-ended nature of these games is their prime advantage; however, a good deal of effort must be expended by the facilitator in orienting the participants to the scenario. After that, the participants will supply the substantive issues for resolution in their arguments and the facilitator improvises based on these. Participants new to matrix games may be uncomfortable in how freewheeling gameplay seems to be until they realize how well this allows for wide-ranging creative thinking.

Colonel Jerry Hall and Lieutenant Colonel Joseph Chretien of the U.S. Army War College's Strategic Simulations Division praised the effectiveness of this method, particularly in exploring current and near-future security challenges compared to historical ones.[43] This makes sense as participants in such institutions are likely to have a better understanding of today's scenarios of concern and can more readily apply the game experience to enhance their understanding of those issues.

System Games

System games have more detailed processes and rules, whether they be RPGs, Matrix Games, manual board or miniatures wargames, or computer games. The more involved titles can provide a richer environment for the participants to execute within but can bound actions in undesirable ways if the rules or facilitators are too constraining. These games often are the most difficult to implement, and—if the games are not very simple—will usually require expert help in the form of contractors, outside faculty, and/or assistance from serious wargame hobbyists. An advantage of using a team expert facilitating the wargame system is that this frees the participants from having to learn the rules in detail. It can be enough to teach players the most basic features of the rules and spend more time on the situation, allowing the expert team to translate the player moves into game actions consistent with the rules. In nearly all cases, system games feature stochastic adjudication processes to regulate the probabilities and range of possible outcomes in combat. System wargame experts are

Figure 6. *Irregular Warfare* wargame at White Sands Missile Range

Source: official U.S. Army photo.

usually also good at explaining the outcome cause and effect relationships to the participants in convincing ways, particularly when those outcomes are not the ones players expected.[44]

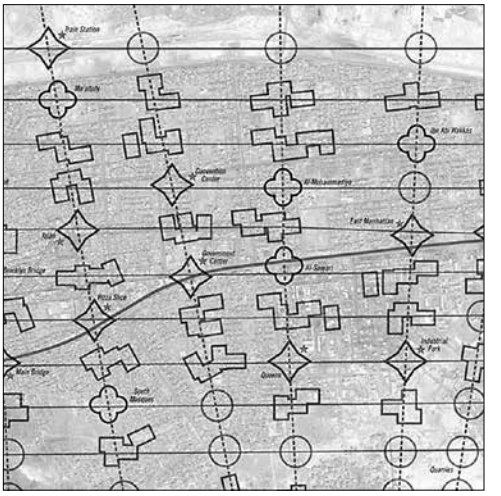
System games, by their very nature, provide an illusion of predictability, of control, given the nature of their databases, rules, and probabilistic adjudication tables. First-time wargame players with a preference for war as a science in the true Jominian spirit usually aim to formulate optimized plans. However, most system games will introduce an element of luck, often using cards and/or dice.[45] Such a representation forces wargame players to deal with a realistic degree of the fog of war and of friction; participants thus must do all they can to calculate probabilities of various outcomes and resulting second and third order effects for a given course of action. There are those wargamers (and military personnel playing wargames) who do not like this as such a greater or lesser degree of randomness undermines their perfectly formulated plans.[46] This, more than anything else, introduces uncertainty into what appears to be a straightforward problem-solving exercise.

Solitaire Games

This is a specific kind of system game or RPG that is explicitly designed for a single player, which usually rules out all Matrix Game approaches. A wide variety of these kinds of commercial/hobby titles exist for both computerized

and board wargames, with more and more sophisticated artificial intelligence (AI) engines.[47] Some games designed for two or more players contain provisions for at least one solitaire system-controlled player, affectionately termed "the 'bot," that nevertheless can render a good solitaire experience. The best ones do not feel like puzzles that—once solved—result in the player winning every time thereafter. Many come in small, easy-to-learn packages and some in big, complex, and lengthy titles that can take months to finish the campaign game. For educational purposes, the smaller, quick-playing ones are going to be the most useful. U.S. Air Force War College (nonresident) used solitaire computer games mailed to its students as part of its correspondence course curriculum.[48] U.S. Army Command and General Staff College uses a single-move computer game, *The Grand Offensive*, to illustrate the conundrum of World War I trench warfare to support the H100 Military History curriculum.[49]

Figure 7. Mapsheet for the solitaire wargame, *Fallujah, 2004: City Fighting in Iraq* (Decision Games, 2016)



Source: Board Geek Games.

Which Situations Are Best to Use—Historical or Hypothetical Scenarios?

Regardless of the type of game, the learning outcome might fit best with a historical situation that really happened, or a hypothetical one that might have occurred in history but did not, or a scenario that represents a current or near-future conflict possibility. This is where a division between hobby/commercial conflict simulation and professional wargaming shows itself, as the former tends to emphasize historical treatments and the latter demands contemporary to near-future ones.[50] The historical scenarios work well in letting students try out their plans to see if they could have done better than their historical counterparts, allowing some counterfactual options to pursue instead. Taking on the role of a historical commander in a well-constructed wargame of any type provides insight into the perceptions, pressures, decisions, and corresponding rationales. Wargaming breathes life into historical situations through immersive decision making. However, history educators do worry that the models cannot do justice in replicating the cause-and-effect relationships that solid historical

investigation uncovers.[51] This requires critical assessment after the game is over, much like the A681 History in Action after action review discussions of what military history *Battle for Moscow* simulates well and what it does not.

The hypothetical current or near-future scenarios are often the most tantalizing for students as they are free from competing against the performance of a historical personage and able to test their mettle against that of their colleagues, unconstrained by history. However, while the model and data behind such games appear to be as good as that in the historical conflict simulations, they generally are not; the question is rather whether these are good enough for the purposes they are used for. Sabin warns us that hypothetical wargames are akin to forecasting the weather; the further out they attempt to predict the future, the less reliable such portrayals are likely to be.[52] Still, they may provide enough of an alternative future/reality that the range of creative thinking might free players from their anchoring biases.

Teaching with Wargames—Challenges and Solutions

Overcoming Design Bias

Like a book author, a wargame designer has a particular perspective on the subject at hand. In the best sense, this desire to use the wargame to provide lessons learned can be for a positive good. Often, the designer's purpose is different enough from the educator's that the game is not truly useful in achieving desired learning outcomes. However, it can happen that the designer's agenda in a wargame that is otherwise seemingly suitable for classroom use is simply too confining or even of questionable veracity. Historical wargame designers have their pet theories that are reflected in their commercial conflict simulations; Department of Defense (DOD) wargames and/or scenarios can often reflect doctrinal imperatives and conventional wisdom about organizational and weapon effectiveness.[53] This can be a danger when trying to "lift" a system or scenario designed for one context (e.g., support to a command post exercise or to demonstrate a specific warfighting capability to its training audience) to employ it for education. As such—whether employing a historical or a hypothetical scenario in a wargame, whether it is a commercial title or a government one—the potential for negative learning is ever-present, particularly given how immersive and compelling a wargaming experience is for the participant. Dr. Peter P. Perla warns that this must be deliberately countered through the after action review:

> They [wargame participants and analysts] deserve and should demand an explanation of why events run counter to their expectations. They must be allowed, indeed encouraged, to be wary and skeptical and to question the validity of insights derived from the game until the source of those insights is ad-

> equately explained. If the reasons underlying an insight seem artificial, the insight may be a false one, and the game system may be in need of correction.[54]

Challenges of Time and Complexity

Most readily available commercial serious wargames take a long time to learn and an even longer time to understand its lessons. This can be mitigated by choosing simple games, designed to be easily played with learning outcomes clearly evident to the participants, even in a single session. This can often mean the instructor must self-design games or heavily customize existing ones. Professor Sabin found he often had to do this, and we have seen locally designed larger wargames at Marine Corps University, such as *Assassin's Mace* and *FMF*.[55] As mentioned earlier, another alternative when using a more complicated wargaming system is to facilitate gameplay by telling wargame players just enough to make required decisions, advising them against catastrophically bad judgments on the spot, with the facilitators applying detailed rules.

Considerations of Demands on Instructors

#1: Let Go of Convention

In the twenty-first century, developments in adult learning methods—andragogy—have challenged higher education professors to resist defaulting to the lecture and instead craft curriculum delivery involving a wide variety of techniques. From the "flipped classroom" approach to the palette of Liberating Structures creative thinking tools, it takes coaching, some experimentation, and plenty of practice to effectively apply them.[56] The major difficulty is getting instructors to let go of the "sage on the stage" model, which feels the safest for those new to teaching. Wargaming, as one of the types of decision gaming methods, can easily suffer from an uninformed perception that it is not a serious learning tool.[57] But even if instructors are open to new ideas in delivering subject matter, there are still a few hurdles to overcome.

#2: Obtain Relevant Expertise

Having both domain knowledge depth in a subject to be taught as well as expertise in teaching it is a challenge, especially for those new to teaching. Add to this the perceptions that wargaming is either too loose (RPG and matrix games) or too complicated (system wargames), it can be seen as ultimately too troublesome or intimidating to reliably apply in the classroom. This goes double for instructors who are not serious wargamers and especially those who might not have much more experience in their substantive topics than their students. When implementing wargaming into education, the capability and credibility of the instructor is central to success—as Johan Elg argues, "without instructor

buy-in, any attempt to conduct an educational wargame is likely to result in a 'complete failure'."[58] If the educator is not genuinely interested in wargaming's potential, the method will not work.

If this is at issue, there are three ways to overcome the challenge of instructor buy-in. The most commonplace solution is to team teach with a wargame, matching up the wargaming apprentice instructor with an experienced wargamer/educator in the classroom. The first way is to use the simplest wargame possible with a minimum of rules, or even just let the instructor implement their own judgments on movement, combat adjudications, and other outcomes resulting from participant decisions. That way the instructor feels in control of the game and the class. The second way is to let the experienced wargamer/educator teach the class with the wargame. Using that approach, much depends on personalities and the alignment of goals and methods between the guest instructor and the host. When there is such an alignment, the approach can be very effective. This takes a significant amount of extra preparation and post-class team coaching, but it is well worth the investment over the long-term. Third, instructors can hide the game from the players in either of the above cases, taking inputs from participants and communicating outcomes without any reference to the conflict simulation behind the adjudications.[59]

Who are the right wargaming experts? Not all wargamers make the best partners when implementing serious games into the curriculum. Consider those with a track record of consulting, editing, and play-testing serious wargames for institutions and/or commercial wargame companies. Those with experience teaching—especially those who have already implemented wargaming into their courses—are the most valuable.

#3: Overcome Time Constraints

The vast majority of wargames—even computerized titles—can take a considerable amount of time to learn them well enough to play, and then even more time to learn to play well enough to be able to teach others. Time taken to learn the wargame as a student can be reduced by the instructor guiding the class through the process of translating decisions into game moves. Students are also not expected to learn to play the game well; winning, after all, is not the point, although it is certainly a motivation when playing. But for instructors, to know the game well enough to explain it in class and know it so well that they can improvise in implementing student decisions in the game routines, as well as advise the students on what does not work, requires both time and effort. As Sabin describes it:

> Whereas one can skim quickly through books and articles to get the gist of the argument, or highlight only key points during a lecture or conference address, this shortcut is not eas-

> ily available with wargames. Enthusiasts and military users are often prepared to spend days playing an individual game . . . as are some academics. . . . Time is hence at a premium within crowded conference schedules or within the standard weekly two-hour classes of a taught module.[60]

There is no easy remedy for this issue; however, the gain in educational effectiveness is worth the cost of time invested. The best way to economize on the time requirement is to again have an expert wargamer/educator—one who knows the game used—to team teach it with an instructor who does not but is motivated to learn.

#4: Scope the Decision Environment Requirement

If wargames are all about decision making, then deciding what roles the participants must assume and what decision dilemmas those roles face must be explicitly articulated to find the best simulation. It is not uncommon for commercial wargames to put players in a number of roles simultaneously, say as a platoon commander as well as a company commander, but the corresponding learning objective should be in exercising company-level decision making. The best games in such a case might be more abstract ones that confine the player to a single role. Older commercial games often tantalized players with the ability to command at all levels—a big board or computer wargame on Gettysburg allowed players to maneuver individual regiments within a brigade as well as all the way up to the Army commander disposing of their corps on the entire battlefield. While they were attractive for simulating all the historical details and generating an illusion of complete control, such titles are much less attractive as classroom teaching devices. Recent commercial games—particularly manual ones—of limited size, scope, and time to play are far better. However, the wargame cannot be so abstract that decision making does not seem to correspond to player roles well or allows unrealistic behavior.[61] Even so, the range of choices may not be wide enough and modifications to existing titles or completely customized in-house game designs will be preferred.

#5: Match the Right Wargame to the Learning Outcomes

Even if a particular conflict simulation game replicates the proper role of the players and creates a corresponding decision environment, the lessons imparted may not relate to the learning outcomes desired. For example, imagine an Enabling Learning Objective that students should be able to describe the transportation trade-offs made in extending the operational reach of a Joint force.[62] The candidate wargame system successfully casts players in the roles of the Joint force commander and functional component commanders. So

far, so good. However, it does not replicate decision making regarding air and surface lift asset allocation priorities between deployment, unit maneuver in employment, and supporting sustainment for both. Whatever the merits of the game in portraying other Joint functions to support corresponding learning objectives, it is not suitable for this one. The way to avoid this problem is evaluating specific wargame candidates against learning outcomes; this is fairly straightforward:

> These wargames should include some form of pre-wargame assessment (analysis) to better understand the current education/experience level of their players and a post-wargame assessment/analysis to determine if the wargame imparted the desired education/experience to the players.[63]

#6: Access Wargaming and Wargaming Support Resources

Even if the other challenges to the instructor applying wargaming in the classroom are met, just trying to learn about the bewildering variety of wargames that might support various learning outcomes, identifying which ones are easily available, and obtaining sufficient serviceable copies can be difficult.[64] While wargame catalog websites cover a vast swath of titles (e.g., Board Game Geek as well as wargame company advertising on their sites), these descriptions are intended for hobby gamers, not educators. Trying to use advertising-style characterizations to get a sense of the decision environment and whether described titles will support learning outcomes is difficult, even though complexity, number of players, and time to play estimates are usually listed.

One does not usually find a large repository of wargames in university libraries or archival collections; ones that exist are usually a small handful of the thousands of titles and expansions published.[65] According to Sabin, it is hard for such institutions to shelve, store, and maintain a comprehensive collection; computer wargames rapidly become obsolete as operating systems are updated, some of the manual board wargames can be bulky and require inventorying of the many pieces and components to ensure completeness.[66] Incomplete sets require a good bit of work and some expense to either fabricate or purchase replacement parts. There are also quite a few wargaming magazines providing game analysis and variants, as well as designers' notes and historical interpretations, but these are so narrowly specialized that not many academic institutions are interested in them. Private collections in the hands of experienced hobby and professional wargamers remain the best resources, if one can find them.[67] The Board Game Geek website does allow users to maintain an inventory of personal collections useful for that purpose. As time goes by, some hobbyists and wargame companies are building and maintaining magazine archives, wargame replacement component scans, and other resources available online.[68]

Many of the games described are long out of print but some noncollectors' titles are still available at reasonable prices on the secondary market.

Wargaming Supporting Education and Cohesion in Units

There is a natural tendency to want to implement a wargaming culture from the top down, but the real challenge is making it sustainable after the initiating leadership moves on. There are just too many other competing things to do. It may be best instead to leverage those Marines who are already wargaming in their off-duty time using games they are currently playing, encouraging them to get friends and colleagues involved, and giving them the resources to help in this. Once achieving a sufficient density of wargaming and wargamers, introducing serious wargames that are better aligned to education learning outcomes may then be possible, as well as rewarding Marines who repeatedly play them and teach others. These measures will better focus some of the interactive learning going on. Then Marine leaders can formalize incentives for particular serious wargame titles best supporting learning outcomes through competitions with recognition and prizes. Ideally, this will set sufficient examples for others to emulate and follow, spreading a Marine Corps wargaming culture.

Decentralize the Effort: Start at the Bottom

It is best to get Marines playing wargames, first and foremost, whether serious games or purely entertainment venues.[69] The most effective ambassadors for wargaming are other wargamers. Those folks will have their favorite games; leaders can let them know the command values wargaming as a hobby and wants them to encourage others to play whatever the existing wargamers like. These might be wargames on a tablet, on a laptop or desktop, board wargames, miniature/model figures and vehicles with rules and dice, role-playing games, anything. Because it is about learning how unit members think as well as practicing making lots of decisions, it does not matter as much what the specific games are. What matters is the competitive spirit, getting people used to the idea of losing, motivating them to improve, and setting the stage for a personal conversion experience for some to embrace serious wargaming as a hobby, if not yet a professional pursuit. Nothing works quite like word of mouth to get the word around and attract attention.

Incentivize Practice through Competitive Recognition

Once a significant number of Marines are playing, structuring a unit recognition and reward system is the next step. Here is also where leaders can leverage some of the popular serious wargames in the unit that better fit training and educational objectives as well as enhancing unit cohesion. This does not have

to involve a lot of time, effort, and expense; indeed, some of the existing wargamers likely will volunteer to set up tournaments for their favorite games. Rewards can be a unit certificate, a chance to park in a unit leader's spot for a day, recognition in a formation or unit email/newsletter/website, and other incentives. PME venues hosting competitive wargame tournaments can award prizes not only to individuals but competitive teams representing a school or other participating organizations; in this way, they help infuse wargaming culture into the operating forces and supporting establishment.

Widen the Wargaming Network

In 1990–91, when Captain Lance Clemens was the officer in charge of the Combined Arms Staff Trainer (CAST) at Camp Hansen, Okinawa, he suffered a shortage of competent command post exercise (CPX)-driver computer operators, colloquially labeled "pucksters."[70] Given the continuing churn of Unit Deployment Program battalions coming and going on the island, enlisted and officer augments to the control cells were eager but inexperienced in serving as CPX pucksters. Being a wargame hobbyist, Clemens started a CAST wargame club on Saturdays, narrowly targeting the "barracks rats" in his advertising campaign to come out and play. He got enough participation to materially alleviate his problems in finding pucksters who could competently move and fight friendly and enemy units in computer simulations or tactile unit icons on a terrain board for CAST exercises.[71]

When he was the 1st Marine Division special services officer, Captain Don Chappell included commercial board and card wargames into unit deployment sets in the mid-1980s.[72] Marines who played the games became interested in the hobby and attended the new Camp Pendleton Conflict Simulations Club on base starting in 1984. That same year, Chappell attracted a sizable number of *Squad Leader* players to play-test *Advanced Squad Leader* for the Avalon Hill Game Company, this author included.[73] Several of the club members would go on to play-test for commercial wargame companies, participate in competitive tournaments, and connect other military members to these organizations and events.[74]

Military society chapters, wargame clubs, PME sessions on Friday afternoons, wargame demonstration days such as those the Warfighting Lab Wargaming Division has sponsored at Quantico in the past, informal brown bag lunch game demo events like those sponsored by the U.S. Army Command and General Staff College, U.S. Army War College, and Marine Corps War College, as well as online wargame competitions such as the U.S. Army Command and General Staff College *Battle for Moscow* VASSAL tournament are all ways to expose interested Marines to the advantages of serious wargaming, both as a hobby as well as a professional education and training venue. One notable example of

this is Marine veteran Sebastian J. Bae routinely sponsoring competitive games of his *Fleet Marine Force (FMF)* design online using Steam's Tabletop Simulator. While such "advertising" gets the initial word out, having a follow-up effort to take advantage of this—building and maintaining interest and enthusiasm within a close-knit wargaming network—is the most important.

Bend the Wargame Scenarios to Meet Educational Needs

Once the network is strong and sustainable, it is easier not only to inject the kind of games that more closely fit overall education and training objectives but leaders can also select and tweak wargame scenarios to achieve specific learning outcomes. As an example, the author ran one situation that led participants to face dilemmas regarding conflicts between their assigned mission and the overall commander's intent. He picked a historical scenario out of a commercial game and modified it to achieve this kind of conflict using a double-blind umpired method to replicate the fog of war, while the game system, *Advanced Squad Leader*, was renowned for its depiction of the friction of war. The players did not have to know the system beyond the very basics of moving and initiating combat; the author performed all these functions based on participant orders.

In the scenario, both sides were charged with missions securing a mixed business and residential complex in an urban environment. The scenario defender started with forces possessing the complex but depended on a line of communication (LOC) to their source of reinforcements unloading at docks on a river's edge. Both sides understood that the ultimate goal of the higher headquarters was to eliminate their opposition and securing the complex was a necessary first step. However, their performance in the game was articulated as accomplishing the specific mission. The attacking player, unaware of this adversary's LOC or reinforcement potential, initially deployed to storm the complex directly. When faced with a deadly surface of fortifications and stout automatic weapons fire, he first infiltrated past and subsequently maneuvered widely behind it, eventually spotting the oncoming enemy reinforcements. While the complex defender perceived this, he did not try to interfere or otherwise react to it for fear of weakening his defenses directly opposite the location of the initial attack. The player conducting the deep envelopment successfully ambushed the enemy reinforcements before they could reach the complex. He then subsequently surrounded the defenses, forcing the other player to spread out to hold onto everything, which he did not have the forces to do. Through this method, the attacking player eliminated the defenses from behind, not only achieving victory in his mission but erasing the enemy forces from the map—a decisive win by any measure.[75] The subsequent after action review was notable in discussing portrayals of surfaces and gaps, the dilemmas when choosing courses of

action between the stated mission and the commander's intent, and the advantages of ambiguity in maneuvering in the face of the enemy.

What Are the Things to Watch Out For?

Excessive Detail

When first looking at some of the wargame titles available today, it is easy to think these games reflect reality with a high degree of fidelity. Sometimes they do to a good enough standard. But even more often, they will not for various reasons; it takes a good bit of discrimination to find and fit the best wargame for the desired learning outcomes. There are many wargames that attract attention because they ooze detailed granularity in weapon and equipment performance, involved simulation of command and control, and even high logistics functioning fidelity and more. Hobbyists with all weekend to play a session have different desires than educators with only a few hours to accomplish their learning objectives. Other games are simpler, using a great deal of abstraction so that they are fast moving and fun. However, they may be abstracting out the very things requiring a bit more detail and providing fidelity in things that are not relevant to the desired instructional outcomes.

Excessive Entertainment

Most wargames designed for civilians are primarily intended to provide entertainment. Ten-minute paintball skirmishes and laser tag battles do not approximate a real firefight. Computer games—particularly the arcade style shoot-'em-ups (i.e., first-person shooter games)—are also prone to this problem. Board and computer wargames that emphasize realism can often suffer commercially if there is not a high dose of continuing excitement as well. Warfare, particularly at the tactical level, is often characterized by long periods of tedium punctuated with moments of sheer terror. This does not translate well into commercially successful wargames. Operational- and strategic-level wargames do not generally suffer from this problem as they are far more similar to what commanders and staffs do in the real world when "making war upon the map" (or on a computer display), frequently far from physical danger.

Official Indoctrination

We have covered the problems of designers' biases before. But one that is particularly difficult to resist in the military originates in molding game situations and scenarios to reflect official doctrine and/or assessments of weapons effectiveness. Both government and commercial wargame designers can easily fall victim to this, and it is hard to spot given all the institutional reinforcement. This is perhaps the hardest to overcome in hypothetical wargame scenarios.

Perhaps the most famous example of excessive indoctrination in DOD war-

Figure 8. The wargame *Firefight: Modern U.S. and Soviet Small Unit Tactics* (Simulations Publications, 1976)

Source: Board Geek Games.

gaming was the notorious Millennium Challenge 2002 evolution, sponsored by the U.S. Joint Forces Command. This was a concept development exercise, a wargame intended as an experiment to try out emerging ideas and technology, and not an educational wargame. Unfortunately, it became clear to the Red Force/Opposing Force (OPFOR) commander, retired Lieutenant General Paul K. Van Riper, that the advertisement of the game as "free play. . . . The OPFOR has the ability to win here" was not quite correct. As journalist and red teaming expert Micah Zemko termed it, "A concept development exercise that was intended to socialize the military around a leap-ahead, futuristic transformation ultimately left precisely the opposite impression."[76] Fortunately, because of the negative press about this specific wargame, none of the scenarios used made their way into the PME schools or unit exercises to support educational goals.

As a contrasting example, James Dunnigan tells the story of his *Firefight* game, published for the Army in the late 1970s, which was supposed to simulate company-size mechanized combat in Western Europe.[77] He tried to use terrain representative of that in West Germany but was told not to. The Army doctrine of the day could be summed up in the following phrase: "What can be seen can be hit, what can be hit can be killed." The Army wanted to highlight the deadliness of long-range direct gun and missile fire in the game. When published, the board looked nearly like open desert with a few small settlements, streams, and patches of trees here and there, but the game did reward engaging at maximum stand-off distances.[78]

Despite Dunnigan's attempts to impose chaos, units in the published game

always followed orders. The designer proposed to include microterrain, weather effects on visibility, and friction in command and control; all were left out of the game at the insistence of the contract sponsor.[79] Even if making honest attempts to minimize organizational parochialism biases, they can all too frequently still creep in and so must be guarded against.

In the aftermath of the 1990–91 Persian Gulf War, game designers pondered what might happen if the United States had to return to the Middle East in force. Twenty years after Operation Iraqi Freedom, such wargames—one titled *Back to Iraq* and published in three different editions—are now judged as quaint relics of a bygone age, given their naive assumptions about how such a war would be fought.[80] None of these games had any DOD sponsorship; the designers worked from open-source material freely available but fell victim to conventional estimates and warfighting wisdom. Getting it wrong when it comes to hypothetical simulation is an equal-opportunity hazard for wargame designers, whether they be DOD or commercial.

Ensuring True Expertise

In the commercial world, hobby consumers are a very discriminating audience and poorly designed wargames do not survive long in such a tight marketplace.[81] Finding those who are expert in wargame application is a necessary requirement, and these are not often the technologists who are quick to sell their particular wargaming "box" or method.[82] One of the difficulties within DOD in the past has been in growing uniformed servicemembers who not only play serious wargames but can design and conduct their own wargame sessions.[83] This shortfall is apparently well understood both inside and outside the halls of government, as there are currently initiatives to develop cadres and communities of professional wargamers.[84]

Learning the Wrong Things

Negative learning is the worst thing that can happen in using wargames for educational purposes. Fortunately for Millennium Challenge 2002, the high-level visibility and controversy led to a widespread understanding of the limitations of the assumptions that led ultimately to its result. In this, the wargame served its wider purpose. But in Dunnigan's *Firefight* game, players usually came away believing they would get many opportunities for long-range direct fire against Soviet tanks, when this would be rare in the broken and undulating terrain of Bavaria. It is fair to ask whether or not this was well understood at the time; Dunnigan clearly did not think so.[85] When using historical wargames or games dealing with fantasy or science fiction topics, one generally will not have as much of this problem. One can compare game performance to history in the former topical simulations and understand the fictional nature of the latter

games. As soon as one tries to model reality as it exists now, a great deal of personal bias creeps in. A one-time run through a scenario or situation is particularly bad. It only reflects one set of variables and—when stochastic resolution mechanisms are used—a single roll of the dice, no matter what the actual probability for a specific event might be. People will have an illusion that the one-time game experience will be close to how a similar actual situation will unfold.[86] Not even several replays of the game would be sufficient to achieve a good statistical sample, and—even then—one is beholden to the game designer's interpretation of reality.

The more realistic the exercise is perceived to be, the more people will want to use the experience and results of the wargame to validate their own ideas. This always happens implicitly, and we often find it going on explicitly. One of the deans of professional analytical wargaming, Dr. Peter Perla, adamantly warns:

> In wargames, as in any approach to study and analysis, there is always a possibility that intentional or unintentional advocacy of particular ideas or programs may falsely color the events and decisions made in a game and lead to self-fulfilling prophecies. The designer of a game has great power to inform or to manipulate.[87]

It is not uncommon to see military briefs advocating concepts or acquisition initiatives citing recent wargame experience as validating these ideas; certainly, that was the intent with Millennium Challenge 2002 and has been the author's own experience.[88] Whatever one thinks about this use, this is *not* what educational wargaming is all about. Educational wargaming cannot validate anything. The best thing that comes out of educational wargaming is participant self-confidence from doing this repeatedly—losing a lot at first but eventually winning on occasion, ideally more and more frequently with experience. This translates into character and corresponding levels of will, governed by experience/intellect.[89] When playing educational games on contemporary topics, experiences and results should always be compared to history to see if we are assuming too much in our favor that has little to no historical precedent.[90] After action reviews must cover not only lessons learned but lessons that should not be learned from the experience.

Too Constraining Learning Outcomes

Employing wargames to promote cohesion in unit PME sessions can also suffer from pitfalls. If bent on achieving very specific training objectives, such as practicing a night river crossing for example, this skews the situation, scripting the problem in a way that this desired event will happen. Such confining

parameters will rob the situation of much of the uncertainty and friction that real tactical decision making suffers from. It is akin to always practicing "long bomb" passes in football, or short lateral passes, or runs in set scrimmage plays where everyone knows what is going to happen. These are fine as rehearsals or drills, but they do not provide competitive scenarios in the truest sense. The group is not sufficiently put under realistic pressures to adapt when the enemy actively facilitates the night river crossing event and is restrained from defeating it outright.

Conclusion

It is an exciting time to be part of wargaming as one of the leading edges of the 2019 *Commandant's Planning Guidance*:

> What we need is an information age approach that is focused on active, student-centered learning using a problem-posing methodology where our students/trainees are challenged with problems that they tackle as groups in order to learn by doing and also from each other. We have to enable them to think critically, recognize when change is needed and inculcate a bias for action without waiting to be told what to do. . . . We must cease viewing PME as something less strenuous and less challenging than other tours of service, and seek to make it as competitive and rewarding as possible.[91]

Injecting wargaming into professional military education, in formal schools, and in the units of the operating force—as well as the supporting establishment—will assist in providing a problem-posing methodology that challenges students to, as the Commandant says, "think critically, recognize when change is needed, and inculcate a bias for action." This is what educational wargaming was historically intended to accomplish.[92] The difficulty is that to make PME *more strenuous* and *more challenging*—comparable to those other tours of service—implementing wargaming will make greater demands on instructors.

Advocates for wargaming in formal school and unit education can be overenthusiastic in their claims for the advantages of this teaching method. Like other innovative decision game teaching methods, such as TDGs and Decision-Forcing Case Method, serious wargames can deliver a lot when experienced hands implement them.[93] It is a fair question to ask how someone not so expert can learn how to use serious wargames in the classroom. For those interested in educating military judgment in decision making, it should be clearer what topics might be amenable to this particular technique. This should assist in formulating requirements for wargaming in education and effectively communicating with serious game experts who can craft implementation of serious wargames

in curriculum. We have seen the major advantages of wargaming that can be accrued when deliberately and thoughtfully implemented, but also some of the traps and pitfalls as well. Most of all, one can see how important instructor "buy-in" is to the effort and to using specific ways to overcome the challenges by using others more expert in educational wargame implementation.

Endnotes

1. "The Joy of Wargaming—The Pilot," *War in a Box: Portable Wargaming on a Budget* (blog), 23 May 2020. The third paragraph emphasizes wargaming as a niche hobby, a sentiment echoed in a number of other wargaming social media sites such as Bruce Geryk, "Wargames in the Data Mine," *Wargame_[space]: Thinking about History, Writing about Games* (blog), 17 August 2018. Admittedly, the wargaming community online is a smaller subset that can be fairly accused of living in an echo chamber. David Michael and Sande Chen, *Serious Games: Games that Educate, Train, and Inform* (Mason, OH: Course Technology, 2006), 17; Matthew B. Caffrey Jr., *On Wargaming: How Wargames Have Shaped History and How They May Shape the Future* (Newport, RI: Naval War College Press, 2019), 129, 202–3; Sebastian J. Bae and Maj. Ian T. Brown, USMC, "Unfulfilled Promise: A Brief History of Educational Wargaming in the Marine Corps," *Journal of Advanced Military Studies* 12, no. 2 (Fall 2021); Maurice Suckling, "The Re-popularization of Commercial Wargames," *Ludogogy: Playful Learning* (blog), 8 November 2020; Hamza Shabad, "Playing War: How the Military Uses Video Games," *Atlantic*, 10 October 2013; Philip Sabin, "Wargames as an Academic Instrument," in *Zones of Control: Perspectives on Wargaming*, ed. Pat Harrigan and Matthew G. Kirschenbaum (Cambridge, MA: MIT Press, 2016), 425, https://doi.org/10.7551/mitpress/10329.003.0044; and James F. Dunnigan, *The Complete Wargames Handbook: How to Play and Design Commercial and Professional Wargames*, 3d ed. (Lincoln, NE: Writers Club Press, an imprint of iUniverse, 2000), 6–7, 170; Michael and Chen differentiate "serious games" as "a game in which education (in its various forms) is the primary goal, rather than entertainment." Caffrey noted an "explosion" in both board and computer wargaming in the 1990s and his description of wargaming in the military and academia is characterized as having reached a "tipping point" as of 2019. While there are signs of momentum across the Services and in defense-related academe, it is perhaps premature to characterize serious wargaming as widespread and enduring as of this writing. According to Bae and Brown, within the Marine Corps there has been a pattern of rising and declining interest in wargaming in military education before. Maurice Suckling lauds the comeback of commercial wargames, with the caveat that much depends on how you define a wargame. Increasing sales for board games in general do not necessarily correlate to sales levels for serious or hardcore wargames as they were in the 1970s and 1980s. As Hamza Shabad says about popular commercial first-person shooter (FPS) wargames, they are useful in quick eye-hand coordination training in "shoot/don't shoot" situations but are not considered suitable for professional military education, a sentiment also echoed by Philip Sabin. Dunnigan goes further than simply deriding such "twitch" arcade-style games as educational tools; he questions the utility of computer wargames in understanding war and warfare since one cannot explicitly see the game engine and assumptions like one can in manual board wargames.
2. Dunnigan, *The Complete Wargames Handbook*, 213–14; and Eric M. Walters, "The Right Tool Wrongly Used," *Fire and Movement: The Forum of Conflict Simulation*, no. 66 (June–July 1990): 38.
3. Dunnigan, *The Complete Wargames Handbook*, 221.
4. Gen David H. Berger, *Commandant's Planning Guidance: 38th Commandant of the United States* (Washington, DC: Headquarters Marine Corps, 2019), 16; Jeff Wong,

"Wargaming in Professional Military Education: A Student's Perspective," Strategy Bridge, 14 July 2016.

5. Sabin, "Wargames as an Academic Instrument," 428; Philp Sabin, *Simulating War: Studying Conflict through Simulation Games* (New York: Continuum International Publishing Group, 2012), 21; and Dunnigan, *The Complete Wargames Handbook*, 6, 213–14, 221. James Dunnigan, the former president of Simulations Publications, and a major influence on wargame design, characterizes wargaming as "a hobby for the overeducated" and offers "wargames are not easy to master. It requires unique mental skills to deal with all that goes on in a wargame and make the game work."
6. Sabin, "Wargames as an Academic Instrument," 421–22.
7. Charles Homans, "War Games: A Short History," *Foreign Policy*, 31 August 2011; C. G. Lewin, *Wargames and Their History* (Gloucester, UK: Fonthill Media, 2012), 40; and Caffrey, *On Wargaming*, 15–17.
8. Caffrey, *On Wargaming*, 17.
9. Lewin, *Wargames and Their History*, 43.
10. Lewin, *Wargames and Their History*, 44. Von Moltke established the Magdeburg Wargaming Club in 1828 as a lieutenant and never lost his enthusiasm for the technique throughout his career.
11. *Marine Corps Order 1550.55*, *Military Thinking and Decision Making Exercises* (Washington, DC: Headquarters Marine Corps, 12 April 1997).
12. Bae and Brown, "Unfulfilled Promise."
13. MajGen Paul K. Van Riper, "Foreword," in Maj John F. Schmitt, *Mastering Tactics: A Tactical Decision Game Workbook* (Quantico, VA: Marine Corps Association, 1994), ix–x.
14. Peter L. de Rosa "The Fall of Avalon Hill," *Strategist*, no. 29 (September 1998): 7–8. The author's wargame recommendations in the pages of the *Marine Corps Gazette* in the 1990s encouraged the Marine Corps Association (MCA) to stock these Avalon Hill Game Company and Victory Games Company titles in the Quantico bookstore. The fate of wargame sales at MCA when Avalon Hill ceased operations was communicated to the author. Avalon Hill was subsequently bought by Hasbro but that company did not continue to publish the full line of previous titles, preferring instead to publish a handful of them and license production of others (e.g., *Advanced Squad Leader* to Multiman Publishing).
15. Sabin, *Simulating War*, 37.
16. "Effective Use of Performance Objectives for Learning and Assessment," Teacher & Educational Development, University of New Mexico School of Medicine, 2005.
17. *Tactics*, MCDP 1-3 (Washington, DC: Headquarters Marine Corps, 1997), 39–56. These are: (1) combined arms, (2) maneuver, (3) exploiting the environment, (4) complementary forces, (5) surprise, (6) trapping the enemy, (7) developing an ambush mentality, and (8) asymmetry.
18. *Tactics*, MCDP 1-3, 27–29; and Mark Herman, *Gettysburg: Deluxe Edition* (Malibu, CA: RBM Studio, 2018).
19. "Professor Philip Sabin—Biography," King's College London, accessed 2 August 2021.
20. Sabin, *Simulating War*, 52–53, 85–90.
21. Patrick Hulme and Erik Gartzke, "The U.S. Military's Real Foe: The Tyranny of Distance," 19fortyfive.com, 25 January 2021. The term *tyranny of distance* was first popularized by Professor Geoffrey Blainey's title for his 1966 book, *The Tyranny of Distance: How Distance Shaped Australia's History.* In contemporary military usage, it is meant as a caution not to depend on technology too much to overcome geographic remoteness that imposes logistical limitations. Designed by the Department of Sustainment and Force Management faculty member S. Bethel. Digital files for the game are available on the Educational Wargaming Cooperative (EWC) Google Drive folder under EWC Challenge '21. *Joint Planning*, Joint Publication 5-0 (Washington, DC: Joint Chiefs of Staff, 2020), III-44–III-55.
22. *Campaigning*, MCDP 1-2 (Washington, DC: Headquarters Marine Corps, 1997), 8.
23. Frank Chadwick, *Battle for Moscow* (Hanford, CA: GMT Games, 2011). Browser-

enabled and iOS versions of the game are available at Oberlabs.com. See also, the open-source boardgame engine, VASSAL.

24. James Jay Carofano, "It's Time to Return to the Principles of War," *National Interest*, 4 May 2016.
25. Sabin, *Simulating War*, 37, 48, 53. To Sabin, the "decision environment" simulates the scale of decision making in real life given the roles of the players, including information received, the interactions involved, various time pressures in deciding, and the nature of decisions made/orders given. For decision dilemmas, see also Johan Erik Elg, "Wargaming in Military Education for Army Officers and Officer Cadets" (PhD thesis, King's College London, 2017), 215; and James Lacey, "Wargaming in the Classroom: An Odyssey," *War on the Rocks*, 19 April 2016.
26. Craig Besinque, *Triumph and Tragedy: European Balance of Power* (Hanford, CA: GMT Games, 2015).
27. Lacey, "Wargaming in the Classroom."
28. Sabin, *Simulating War*, 61; and *Warfighting*, 5–13.
29. SNAFU refers to "situation normal, all fouled up" from the less polite U.S. military term originating in World War II.
30. This is not only true for ground combat games covering all historical eras but also naval and air wargames. Good examples of the latter include *Flying Colors: Fleet Actions in the Age of Sail* (Hanford, CA: GMT Games, 2005); and *Elusive Victory: The Air War over the Suez Canal, 1967–1973* (Hanford, CA: GMT Games, 2009).
31. Don Greenwood, *Advanced Squad Leader Rules*, 2d ed. (Millersville, MD: Multiman Publishing, 2001); and *Beyond Valor*, 2d ed. (Millersville, MD: Multiman Publishing, 2000). The author had been a play-tester for this game system and core module (and another expansion), and it was one of very few games at this scale for the time. Today, there are many good tactical systems replicating the chaos of war at that level and any of them can serve a similar purpose.
32. Sabin, *Simulating War*, 62.
33. Lacey, "Wargaming in the Classroom."
34. James Clear, "All Models Are Wrong, Some Are Useful," *James Clear* (blog), accessed 2 August 2021.
35. Bae and Brown, "Unfulfilled Promise."
36. *How to Master Wargaming: Commander and Staff Guide to Improving Course of Action Analysis* (Fort Leavenworth, KS: Center for Army Lessons Learned, 2020), 24.
37. The author first experienced this in the Michael D. Wyly's graduate-level course, Contemporary Tactical Thought, American Military University, in 1993. After the author provided the solution to Wyly's TDG, he would then lead the author through a dynamic scenario to test how the plan could accommodate the unexpected. Wyly role-played the subordinate commanders, key staff, and external actors reacting to fragmentary orders received.
38. Col Thomas X. Hammes, USMC (Ret), "TDGs Return," *Marine Corps Gazette* (blog), 1 May 2010. Marine Capt Mike McNamara enhanced the Wyly method of playing out solutions through this complicating factor. As Hammes relates, McNamara "started with the premise that TDGs are not just about teaching tactics but are really about teaching Marines how to analyze the fight they are in and, through lots of different games, learn how their fellow Marines think. The games are designed to provide the basis of the meeting of the minds essential to maneuver warfare."
39. Jon Peterson, *Playing at the World: A History of Simulating Wars, People, and Fantastic Adventures, from Chess to Role-Playing Games* (San Diego, CA: Unreason Press, 2012), 275, 303, 309.
40. Rex Brynen, "Engle: A Short History of Matrix Games," PAXsims, 26 July 2016.
41. Elizabeth M. Bartels, "Wargames as an Educational Tool," *RAND Blog*, 8 February 2021. Bartels call this kind of matrix game application "role playing for peer-learning and community building."
42. Tim Price, "Running Matrix Games," in *The Matrix Game Handbook: Professional Ap-*

plications from Education to Analysis and Wargaming, ed. John Curry, Peter Perla, and Chris Engle (Milton Keynes, UK: Lulu.com, 2018), 43. Price explains the "Simple Combat Resolution Using Dice (SCUD) technique"; and Johan Elg, "Effective Learning at the Swedish Defence University," in *The Matrix Game Handbook*, 130.

43. Col Jerry Hall, USA, and LtCol Joseph Chretien, USA, "Matrix Games at the U.S. Army War College," *PAXsims*, 2 September 2016.
44. Johan Elg, "Instructor Buy-In: Pitfalls and Opportunities in Wargaming," *Royal Swedish Academy of War Science Proceedings and Journal*, no. 2 (June 2019): 7. This is particularly true for military participants, who are all bent on winning and ready to label an adverse result as a problem in the simulation.
45. There are system games that are completely absent an element of luck but remain very hard to win and not only in the way *Chess* or *Go* is difficult. Some games, like Avalon Hill/Hasbro Games Company's *Diplomacy*, are multiplayer and human nature introduces a degree of uncertainty. Others use blocks that only the owning player can see the characteristics of the force represented until combat occurs using a linear algorithm with no dice or cards—combined with allowing the players great latitude in set up, such as in Simmons Games's *Bonaparte at Marengo* and *Napoleon's Triumph*, "perfect plans" are nearly impossible to carry out.
46. Robert M. Citino, "Lessons from the Hexagon: Wargames and the Military Historian," in *Zones of Control*, 443.
47. That Cowboy Guy, "Simulating AI in Solitaire Board/Card Games," *Indie Game Devlogs* (blog), 7 June 2017. This is a relatively comprehensive survey of commonly used techniques to simulate an opposing player. For computer wargames, AI methods remain something of a proprietary secret, but commercial manual wargames provide the best examples of a range of methods used. Some AI systems are intended to generate a rich narrative experience and can create a player sensation that they are just along for the ride, rolling dice or selecting cards to consult various outcomes on a table based on earlier game events and player decisions. Solitaire strategic bombing games, where the player is either a bomber commander or a fighter interceptor (Legion Games's *Target for Today*, 2017; and Compass Games's *Interceptor Ace*, 2019), or even a U-boat captain (GMT's *The Hunters*, 2013) or a destroyer skipper (Legion Games's *Picket Duty*, 2013) are representative of this genre. Others, however, have a very rich decision space where the random "chit draw out of a mug" AI feels quite unforgiving when the solitaire player makes a mistake (Hollandspiele's *Agricola: Master of Britain*, 2016; and *Charlemagne: Master of Europe*, 2017) or the player takes action on specific areas of the map, triggering AI actions (Decision Games's D-Day series). There are also multiplayer wargames where factions that do not have a human player will employ flowchart methods to guide the "robot" or "bot" decision making. GMT's later COIN series games, *Fire in the Lake*, 2014, with the *Truong* expansion, 2020, for the Vietnam War, or *Liberty or Death*, 2016, on the War for American Independence are good examples, as is the wildly popular Leder Games *Root*, 2018, when played with the *Root Clockwork* expansion, 2020. A detailed description of these AI techniques would merit a long article/book chapter in itself.
48. The author played two such games when completing this course in 1999–2000; one allowed the player to experiment with various force flows deploying into a theater, while the other enabled different air power sortie apportionment percentages for various missions in a Joint warfare scenario.
49. Elg, "Wargaming in Military Education for Army Officers and Army Cadets," 211.
50. Sabin, *Simulating War*, 36.
51. Robert MacDougall and Lisa Faden, "Simulation Literacy: The Case for Wargames in the History Classroom," in *Zones of Control*, 450–51.
52. Sabin, *Simulating War*, 62.
53. Dunnigan, *The Complete Wargames Handbook*, 223–24, 228–32.
54. Peter P. Perla, *Peter Perla's the Art of Wargaming: A Guide for Professionals and Hobbyists*, ed. John Curry, 2d ed. (Bristol, UK: Lulu.com, 2011), 172.

55. Sabin, "Wargames as an Academic Instrument," 425–26; and Bae and Brown, "Unfulfilled Promise."
56. "What, Why, and How to Implement a Flipped Classroom Model," Office of Medical Education Research and Development, Michigan State University, accessed 10 August 2021; and "Liberating Education," Liberating Structures: Including and Unleashing Everyone, accessed 10 August 2021.
57. Sabin, *Simulating War*, 45.
58. Johan Erik Elg, *Wargaming and Military Education for Officers and Cadets*, 220; and Elg, "Instructor Buy-In," 6–10.
59. Elg, "Instructor Buy-in," 10–11.
60. Sabin, "Wargames as an Academic Instrument," 430.
61. Sabin, "Wargames as an Academic Instrument," 431, 434. According to Sabin, this is (1) due to the sensitivity to professional military wargaming, which is often classified; (2) the niche nature of hobby wargaming, usually the province of hobby buffs and not visible to the public as a whole; and (3) the dubious nature of the term "game" in the minds of most people, who think this is something for children and not serious adults. See also Perla, *Peter Perla's Art of Wargaming*, 17, for a 1990 characterization that arguably still holds true in some quarters, despite 30 plus years of wargaming's emergence in popular culture: "The fact is that wargames and wargaming are consistently misunderstood, denigrated, and even denounced, not only by gaming outsiders, but also by gaming proponents and practitioners."
62. "Terminal and Enabling Learning Objectives," Implementing NCI Course Curriculum, accessed 10 August 2021. "Each individual lesson of every course has enabling learning objectives that support behaviors that, taken together, facilitate the achievement of the terminal objectives. These objectives state what participants will know or be able to do as the result of a lesson." Terminal Learning Objectives are top level educational outcomes, whereas Enabling Learning Objectives are the intermediate "stepping stones" to achieve them.
63. Col Jeff Appleget, USA (Ret), Col Robert Burks, USA (Ret), and Fred Cameron, *The Craft of Wargaming: A Detailed Planning Guide for Defense Planners and Analysts* (Annapolis, MD: Naval Institute Press, 2020), 176.
64. "What Is the Average Size of a Wargame's Print Run?," Board Game Geek (discussion thread), accessed 2 August 2021; and Dunnigan, *The Complete Wargames Handbook*, 7. Despite the plethora of wargaming titles in the board wargaming arena today, most have very limited print runs and thus go out of print quickly. Quite a number of desirable titles are only available on the secondary (used and collector) markets, the most popular ones can command quite high prices for a single copy. Whereas in the 1970s and 1980s, a successful print run would be 40,000 copies or more (Dunnigan mentions runs as high as 50,000 to 100,000), today, 1,000–3,000 copies in a single print run is considered good. This specialization within the board wargame community arguably fragments what is already a niche community into several subniches. Game publishers aim to mitigate this by concentrating on series games that share a similar system but cover a wide variety of specific battles and campaigns. However, over time, these series have also proliferated to the point where there can be a dozen different systems portraying a topic, such as Napoleonic-era tactical warfare, each with its own fan base who often do not want to play their favorite battles in systems they do not favor.
65. Sabin, "Wargames as an Academic Instrument," 430.
66. Sabin, "Wargames as an Academic Instrument."
67. "Microbadge—Herculean Board Game Collector," Boardgamegeek.com, accessed 2 August 2021. The author's collection of more than 3,000 titles, expansions, and not counting complete runs of arcane wargame journals and fanzines, is not untypical for serious wargame hobbyists. Classified as a "Herculean Collector" (2,500 games or more), there are (as of 10 July 2021), 392 other Board Game Geek website members who earn that label. An additional 56 are classified as "Ultimate Collector," with 5,000 or more games. Of course, there are likely others with similar collection sizes who are

not website members. So far, the author has yet to discover an institutional collection of similar size and topical breadth; such may exist but is not easily visible if so.

68. One good example is *The View from the Trenches* fanzine website collection of old Avalon Hill Game Company *The General* magazines spanning a couple decades of publications in PDF. Another example of replacement parts for some of these old Avalon Hill games is Camelot Games Company Store for mail order counters but also map boards and other components.
69. Sebastian Bae, "Just Let Them Compete: Raising the Next Generation of Wargamers," *War on the Rocks*, 9 October 2018.
70. Author's recollection as he attended these meetings while stationed on Okinawa.
71. The author attended these game club meetings whenever he was on the island. There was another group of wargamers in the southern portion of Okinawa who would play in the Schilling Recreation Center on board Kadena Air Base every Saturday, although other types of board games were also played there.
72. Author's recollection as he was a member of 1st Marine Division when Capt Chappell was the special services officer; both he and Chappell were also members of the Camp Pendleton Conflict Simulations Club. Marines deployed to Camp Wilson, Marine Corps Air Ground Combat Center Twentynine Palms, CA, often appreciated Chappell including in-unit deployment kits to the Avalon Hill Game *Up Front*, a tactical WWII squad-level card game that required no board and therefore no table. Marines could play the game sitting on their cots.
73. Capt Chappell would go on to win a 1986 national *Advanced Squad Leader* tournament, playing against opponents from all over the United States. Don Chappell, email interview with author, 26 May 2021.
74. Besides the author and Capt Don Chappell, other notable members of the Camp Pendleton Conflict Simulations Club who went on to advise commercial wargame companies included Rich Hoffman, a key play-tester and rules editor for Compass Games's upcoming title *Hitler's Last Gamble: Designer's Signature Edition*; Harold Buchanan, the civilian designer for GMT's *Liberty or Death*, Decision Games's *Campaigns of 1777*; and the upcoming GMT card game *Flashpoint: South China Sea*.
75. This scenario was inspired by a situation in the vicinity of the Central Railway Station in Stalingrad in September 1942. The defenders presented elements of a mixed Soviet force with reinforcing companies from the 42d Guards Infantry Regiment against the well-led yet depleted forward battalions of the German *71st Infantry Division*.
76. Micah Zemko, "Millennium Challenge: The Real Story of a Corrupted Military Exercise and It's Legacy," *War on the Rocks*, 5 November 2015.
77. Dunnigan, *The Complete Wargames Handbook*, 233–51.
78. Dunnigan, *The Complete Wargames Handbook*, 240.
79. Dunnigan, *The Complete Wargames Handbook*.
80. *Back to Iraq* (Bakersfield, CA: Decision Games, 1993). The first edition was published two years after the war in 1993, the second in 1999, with the third edition released in 2001. The game sports some fairly low ratings on the Board Game Geek website, as they are now arcane curiosities rather than valuable simulations of conflict given the context.
81. Walters, "The Right Tool Wrongly Used," 37–38.
82. Stacie L. Pettyjohn and David A. Schlapak, "Gaming the System: Obstacles to Reinvigorating Defense Wargaming," *War on the Rocks*, 18 February 2016; and Peter P. Perla, "Now Hear This—Improving Wargaming Is Worthwhile—and Smart," U.S. Naval Institute *Proceedings* 142, no. 1 (January 2016).
83. Jeff Appleget, Jeff Kline, and Rob Burks, "Revamping Wargaming Education for the U.S. Department of Defense," Center for International Maritime Security, 17 November 2020.
84. Bae, "Just Let Them Compete." Bae has followed in the footsteps of Sabin's course in wargame design at Kings College London through offering his own design course at Georgetown University and sponsors the Georgetown University Wargaming Society. Rex Brynen teaches simulation design and implementation in education at McGill

University in Canada and Dr. James Sterrett offers an elective course in wargame design at the resident U.S. Command and General Staff College, Fort Leavenworth, KS. These are just a few representative examples.

85. Dunnigan, *The Complete Wargames Handbook*, 239–40.
86. Perla, *Peter Perla's the Art of Wargaming*, 172. As Perla relates: "The power of a wargame to communicate and convince, however, can also be a potential source of danger. Wargames can be very effective at building a consensus on the importance of key ideas or factors in the minds of participants. They attempt to create the illusion of reality, and good games succeed. This illusion can be a powerful and sometimes insidious influence, especially on those who have limited operational experience."
87. Perla, *Peter Perla's the Art of Wargaming*.
88. Zemko, "Millennium Challenge." The author, as the Ulchi-Focus Lens (UFL) Command Post Exercise (CPX) planner at Combined Forces Command/U.S. Forces Korea (CFC/USFK) J2 (Intelligence), saw various DOD agencies and activities helping to resource the training event to "showcase" particular Joint intelligence capabilities, even though the exercise was not designed toward that end. As the G2 of Marine Forces Command in the latter half of the first decade of the twenty-first century, the author observed much the same in U.S. Joint Forces Command J7 Futures Battle Lab computerized simulations/wargames as well.
89. Eric Walters, "Wargaming and Military Culture: Education and Cohesion Building" (PowerPoint presentation, March 2000).
90. Col Trevor N. Dupuy, USA (Ret), *Numbers, Predictions, and War: The Use of History to Evaluate and Predict the Outcome of Armed Conflict*, rev. ed. (Fairfax, VA: Hero Books, 1985), 19–31. Dupuy uses quantified methods to predict weapons effects but finds these typically reflect weapons proving ground performance and do not account for historical conditions of terrain, weather, human factors, and other variables when comparing weapons performance statistical calculations to real-world outcomes.
91. *Commandant's Planning Guidance*, 16.
92. Appleget, Kline, and Burks, "Revamping Wargaming Education for the U.S. Department of Defense."
93. Bruce I. Gudmundsson, "Decision-Forcing Cases," Military Learning Library, 11 November 2015. According to Dr. Gudmundsson: "A decision-forcing case is an exercise which asks students to solve a problem faced by an actual person at some point in the past. Because the problem is drawn from real life, a decision-forcing case is a type of case study. Because students are asked to provide specific solutions to a concrete problem, a decision-forcing case is also a kind of decision game. In other words, a decision-forcing case is both a case study that asks students to make a decision and a decision-game based on real facts. A case study that describes an event without asking students to make a decision is not a decision-forcing case. Rather, it is a 'retrospective case study.' Likewise, a decision game based on an imaginary scenario is not a decision-forcing case, but a 'fictional decision game'." Tactical decision games fall into this "fictional decision game" category.

Educational Wargaming
Design and Implementation into Professional Military Education

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Abstract: In light of the *Commandant's Planning Guidance*, there is a renewed emphasis on educational wargaming in professional military education (PME). While wargaming has a long history in PME, there is currently a gap in the academic literature regarding wargaming as an adult educational tool. Scientific study has focused on adult education theory and models generally, highlighting the identification of four different learning experiences, each tied to a learning style: concrete experience, which suits those with a diverging earning style; abstract conceptualization, which suits those with the converging learning style; reflective observation, for those with an assimilating learning style; and active experimentation, which works well for those with an accommodating learning style. By effectively engaging each of these four experiences, educational wargaming can have utility for a diverse array of learning styles.
Keywords: wargaming, adult education, professional military education, PME, adult learning

The Commandant of the Marine Corps has called for an increased emphasis on wargaming as both a tool to assess new concepts and as a means to get Marines "reps and sets" in education and training, thereby

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facilitating improved combat decision-making skills.[1] The Commandant has recognized the value of wargaming not only as a means to evaluate and refine various courses of action or to test new concepts, but also as a means to teach and evaluate student learning outcomes in a professional military education setting.[2] This is the essence of educational wargaming, the purpose of teaching or evaluating the extent to which students have learned and can apply material as a means of professional development.

While wargaming has a long history in military education, a trend that spans more than a century across multiple nations, there does not appear to be a holistic approach to understanding how best to develop and implement wargames as educational tools within a larger curriculum. A student-designed wargame, *Able Archer 83* (AA83), was designed as part of a pilot program at Marine Corps University, Command and Staff College (CSC).[3] The ostensible purpose of the program was to design a prototype educational wargame and then assess the game's utility as an educational tool as well as student learning outcomes. While preliminary data collection indicates that the design team was successful in this effort, the team's experience provides additional insight into how best to design and implement educational wargames as part of a comprehensive educational curriculum.[4] The purpose of this article is to highlight lessons learned by the student design team in how best to design and implement educational wargaming as a component of professional military education.

In particular, the team gleaned three overarching lessons. First, educational wargames must be designed to accommodate all learning styles, which can be seen as analogous to the phases of Alice Y. Kolb and David A. Kolb's learning cycle.[5] In doing so, more student activities than just game play sessions may be necessary and may include post-play reflection in the form of seminar or group discussions. Second, game materials should complement the concepts as well as the verbiage used in other educational materials to ensure both maximum utility as well as ability to assess learning outcomes. Third, to accomplish this second goal, educational wargames should be designed using a combination of sequential and iterative design. Learning objectives, game mechanics and design, and assessment tools should be developed sequentially, in that order, once the previous component is as near to complete as possible. However, each individual component should be designed iteratively in order to continuously refine and improve the educational and assessment utility.

This article begins with a description of educational wargames, as compared to wargames designed for other purposes. Following that is an overview of adult education theory, serious games, and wargaming within professional military education. The article then provides an overview of the design process of student-designed wargame AA83 and how the design team attempted to design a game to stimulate a variety of learning styles. Finally, the article will

highlight lessons learned by the design team in the effective design and implementation of educational wargames into a larger curriculum of professional military education.

Adult Educational Theory and Models

The value of experiential learning is well known and highlighted as a critical component for lifelong learning as a component of professional development in the Marine Corps.[6] Key concepts, which contribute to the effectiveness of experiential learning, include individual factors, instructional factors, and environmental factors, all of which must be considered when designing a curriculum to educate military professionals.[7] These concepts are all tied to the science of learning, within which there is a particular discipline related to adult education (andragogy) as opposed to childhood education (pedagogy).[8] In particular, experiential learning can prove valuable to military professionals, as it fosters adaptability and problem solving.[9]

Adult Education Theory

Andragogy makes a series of assumptions about adult learners. These assumptions are rooted in increased maturity, experience, desire to learn, and a focus on practical- or problem-centric learning.[10] Based on these assumptions, there are a number of steps that educators may implement to improve the adult learning experience. These measures include setting a cooperative environment in which educators and learners work collaboratively to achieve objectives (solve problems) aligned with the learner's particular interests.[11] Fundamental to this approach is that adults desire to understand why they are learning and that they learn more effectively by doing rather than memorization of facts. One criticism of andragogy as a theory is that it can lead to culture blind approaches, which minimizes the value of an authoritative instructor central to many cultures.[12]

Another approach to adult education is *transformational learning*, or trying to effect changes in the way individuals think about themselves or their environment.[13] Transformational learning has been described as a rational process in which learners reflect on and discuss their learning experience.[14] To facilitate this reflection and discussion, it is imperative that the learning environment be free from bias, takes place in an accepting environment, and is led by an instructor who ensures that all participants have free and complete information.[15] However, there have been two main critiques leveled at transformational learning. The first is that it fails to account for different frames of experience based on race, culture, or historical experience of varied learners in a single learning environment.[16] The other critique is that transformational learning is hyper-rational and minimizes intangible aspects of learning such as relationships and emotion.[17] Critical aspects of transformational learning include the

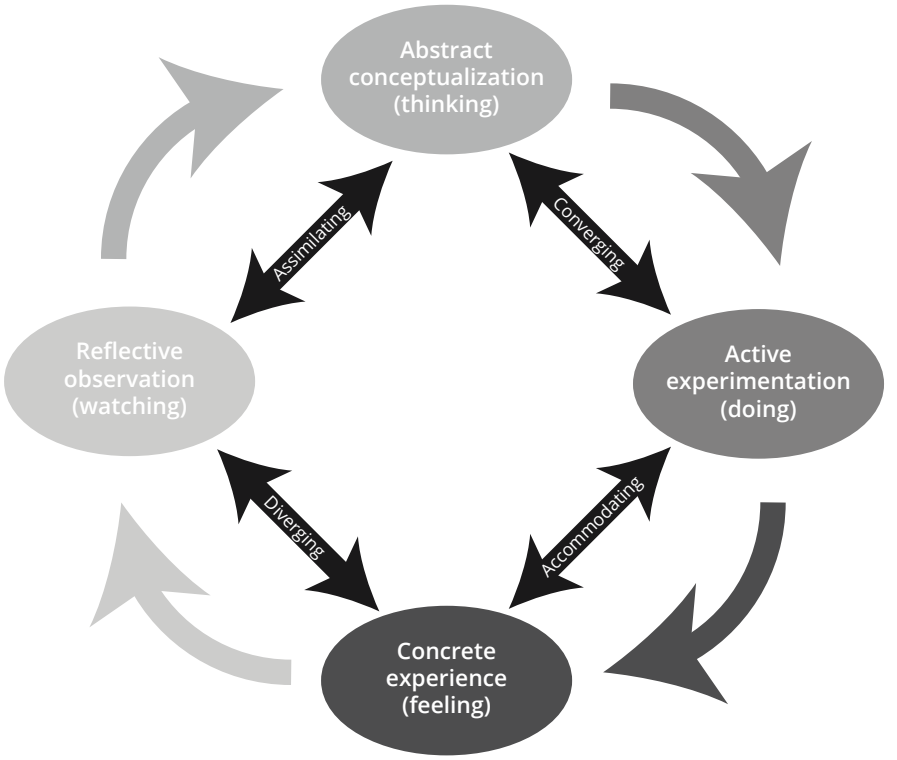
provision of immediate and helpful feedback, tailoring learning activities to student strengths and weaknesses, and developing learning strategies that incorporate different perspectives and "frames."[18] Regardless of the approach, authors have attempted to articulate practical advice to achieve best outcomes in adult education.[19]

These tools include efforts to make the learning environment mirror the working environment. The more the educational environment adheres to the learner's work environment, the greater application of learning outcomes to real-world scenarios. Educators can achieve this goal by using real-world examples or fostering small team or group work instead of individual effort, thereby engaging the adult student's desire for practical application of their knowledge, as opposed to theoretical understanding divorced from practical use. This practical advice on improving adult education makes more sense when viewed from the perspective of learning styles and associated educational course design.

Alice Kolb and David Kolb focus on experiential learning and advance basic propositions about learning.[20] First is that learning is best conceived as a process, as opposed to a series of outcomes. This process should engage students and provide regular and useful feedback. Second is that all learning is relearning, in the sense that it draws on the learner's beliefs and ideas. During learning these beliefs and ideas are tested and integrated with more refined beliefs and ideas. Kolb and Kolb also posit that learning requires a resolution of conflict between opposing modes of adaptation to the world. In this view, conflict and disagreement drive learning, as the learners seek to reconcile the apparently contradictory information. Kolb and Kolb also describe learning as a holistic process of adaptation consisting of a tension between four mental models: thinking, feeling, perceiving, and behaving. In this environment of tension, learners achieve results through continuous transactions between themselves, other participants, and their environment. Last, Kolb and Kolb offer that learning is the process of creating knowledge through experience. At least one author has posited that educational games are particularly effective at stimulating the experimentation phase of the learning cycle and that the knowledge gained through experimentation, reflection on the results of a player move, and conceiving of a new move or strategy is emblematic of this cycle of learning through experience.[21]

From this backdrop, Kolb and Kolb conclude that there are "grasping" experiences, in which learners understand the concepts being taught, and "transforming" experiences, which change the way learners think about a particular issue. Grasping experiences include both concrete experience and abstract conceptualization. Transformational experiences engage reflective observation and active experimentation. All learning involves some component of each of these experiences, which tie to a learning cycle of thinking (active conceptualization)

Figure 1. Learning cycle and corresponding learning styles



Source: courtesy of author, adapted by MCUP.

and doing (active experimentation), feeling (concrete experience), and watching (reflective observation). In turn, these learning experiences are linked to four basic learning styles.

The first learning style is *diverging*. These learners are best at viewing concrete situations from many points of view. They learn best through concrete experience and reflective observation, feeling, and watching the results of their previous actions. The opposite learning style is *converging*, where learners tend to be best at finding practical applications for ideas and theories. Converging learners learn best through an iterative practical application of an idea or process, by which the learner can experiment with new knowledge (active experimentation), observe or reflect on the results, and conceive of new approaches to the learning scenario in real time (active conceptualization).[22] *Assimilating learners*, who increase knowledge through active conceptualization and reflective observation experiences, are best at understanding a wide range of information and boiling it down to a concise and logical form. Last, *accommodating learners* tend to be hands-on, focusing on their first inclination rather than logical analysis. Their dominant learning abilities are found in the concrete expe-

rience and active experimentation experiences. Though overlapping somewhat with the learning experiences for converging learners, accommodating learners tend to draw more educational utility from the concrete experience or "feeling" portion of the experience as opposed to the active experimentation or "doing" portion of the experience.[23]

Wargames and Serious Games as Educational Tools

While gaming often has a negative or pedantic reputation in educational circles, it has a long history in the military educational system, and a number of authors have attempted to describe why wargaming is a useful educational tool.[24] Discussion has included the "laws of learning" and how those apply in the wargaming context.[25] The literature has identified six laws of learning and those aspects of wargaming or game design that support the application of those principles. In essence, these laws are what give wargames or other experiential learning tools their utility; they make knowledge stick.

The first law is readiness; essentially this means that the learner is mentally, physically, and emotionally ready to learn.[26] Adult learners, as previously discussed, are often more motivated to learn and thus ready.[27] Similarly, games generate "flow," or the state in which a player focuses on the game to the exclusion of external stimuli.[28] Flow is created by the narrative aspects of the game, as well as the give and take feedback between the player, the game, and the opponent (in multiplayer games).[29]

The second law of learning is "exercise" or the learning experience that causes the student to exercise or use a skill.[30] Wargames excel in this context, as they require students to make decisions and better support development of critical thinking and decision making than other nonexperiential forms of learning.[31] This problem-based learning provides context and purpose for the exercise of critical thinking and decision-making skills and provides practice in a simulated environment that closely matches the decisions military professionals will need to make.[32] Military officers may also adapt their player behavior to best suit the requirements of the game and the nature of their opponent.[33] Players may be openly antagonistic to one another or they may cooperate in achieving a common goal. Often, the strategy adopted from one play to another will vary based on the opponent or simply the way the game plays out.[34]

The third law of learning is "effect." In essence, effect means that students learn more with positive emotions.[35] A well-designed wargame should increase positive emotions by simply being fun to play.[36] Effect is closely tied to the fourth law of learning, "intensity." The more intense the feelings or emotions associated with a learning experience, the more effectively the student assimilates the learning objectives.[37] Particularly in military education, the competitive aspect of the contest of wills can increase the intensity of feelings or emotions

among military officers, leading to greater concentration on the task(s) at hand and thus improved learning outcomes.[38]

The final two laws of learning are related—"primacy" and "recency." The concept of *primacy* posits that students more readily learn the first piece of information presented.[39] *Recency* indicates that students better recall information learned most recently and that learning can be improved through cyclical or iterative reinforcement and building upon concepts recently taught.[40] Games contribute to this by adequately designing feedback loops to reinforce the importance of certain player or opponent actions.[41] Furthermore, games often include immediate consequences for poorly planned or executed player actions, contributing to a personalized understanding of why the decision leads to certain consequences.[42]

One researcher has tied wargames to a learning cycle very much akin to Kolb and Kolb's learning cycle.[43] Johan Elg has proposed that wargames encourage a cycle of learning as follows. First, during proposition, the player considers possible actions to take and makes a decision or proposition as to which action or actions best suit the scenario. Elg then posits that the player tests their proposition by making a game move. The play result will provide feedback in the form of a reaction. From this, the player enters what both models term *reflection*, by which the player assimilates new information and may change their playing style to suit the new mental model. With this perspective, it appears that wargames have the potential to impact each stage of Kolb and Kolb's adult education cycle.

Other researchers have examined the effectiveness of serious games and scenario-based simulation in education.[44] Evidence supports the effectiveness of serious games as an educational tool; however, there does appear to be a detrimental impact to learning effectiveness in games that impose an excessive mental workload.[45] Thus, there is good reason to believe that wargaming as an educational tool is founded on solid adult educational theory. However, effective implementation of educational wargaming into professional military education requires a holistic approach to both game design and assessment of learning outcomes.[46]

Student-Designed Wargame AA83 and the Learning Cycle

The student wargame AA83 was built using three contributing elements to the game context: the real-life Exercise Able Archer 83, the 2018 unclassified *Summary of the National Defense Strategy* (NDS), and the newly designated warfighting function of information.[47] The group then examined the key aspects of these elements of the game context and used those to develop the primary educational objectives of the wargame.

Elements of Game Context

The basic design of student-designed wargame AA83 is that two players, one Soviet and one American, are engaged in strategic competition within the timeframe of the late 1970s/early 1980s Cold War. The basic mechanism is to use a variety of different types of cards to achieve the player's objectives.[48] Phase one begins when players select a national security strategy and complementary agency. The national security strategy card provides a player's "win conditions," or minimum scores a player must achieve across a series of three competing national security priorities to defeat the opponent. During phase two, players then build a deck of 25 tailored player cards to achieve their required win conditions. During phase three, players employ their card decks with the intent of both achieving their own win conditions, while simultaneously frustrating those of the opponent. All player cards are designed using the historical scenario of Exercise Able Archer 83 and Cold War state competition as a backdrop, including both real historical events as well as counterfactual events, which would have been feasible at the time. In addition, the design team drew game components from other aspects of the game frame. Key aspects, by game context component, are as follows.

Exercise Able Archer 83

Exercise Able Archer 83 has been characterized as the nearest that the United States and the Soviet Union came to nuclear war since the Cuban Missile Crisis in 1962.[49] The exercise is critical, but the attendant tensions are the culmination of the previous two years of the Ronald W. Reagan presidency. Heightened rhetoric on both sides, exemplified in part by President Reagan's designating the Soviet Union as "the focus of evil in the world" and an "evil empire" contributed to a tense security environment.[50] This was exacerbated by increased military shows of force by the United States, designed to show that the Department of Defense (DOD) possessed a qualitative military advantage over its Soviet adversaries.[51] From this perspective, Exercise Able Archer 83 was particularly provocative, in part because it tested many new aspects not previously included in a U.S. nuclear command post exercise.[52] The exercise was but one component of this environment in which the risk of strategic miscalculation was heightened.[53]

A significant part of this miscalculation was based upon the fact that President Reagan caught the Soviets off-guard.[54] Rather than continue the conciliatory approach of President James E. "Jimmy" Carter or revert to the realist détente approach of his fellow Republican president Richard M. Nixon as the Soviets expected, President Reagan adopted a much more aggressive approach.[55] While this approach had its merits, it also had the unintended or unforeseen consequence of signaling to the Soviets that the United States was preparing to launch a secret and preemptive nuclear strike.[56] As a result, and after being

briefed on intelligence community estimates of Soviet fears, President Reagan recognized the need to adopt a more stable and predictable approach, which was in turn less provocative.[57]

2018 *National Defense Strategy*

Student wargame AA83 also incorporates the 2018 *National Defense Strategy*'s (NDS) imperative to shift strategic focus from violent extremist organizations to long-term strategic competition with nation-state adversaries.[58] In many ways, AA83 provides a useful parallel to today's strategic environment, particularly vis-à-vis Russia, as Russian president Vladimir Putin is a product of the Soviet system and exhibits much of the same decision making that pervaded the Soviet system.[59] In addressing this component of the AA83 game context, the designers sought to focus educational goals on the dynamic and volatile nature of the Cold War and current security environments, as well as the need to integrate DOD assets with all of the other instruments of national power to achieve U.S. objectives.[60]

From the 2018 *National Defense Strategy*, the team identified two key concepts. The first concept is competition in a dynamic and volatile security environment. To simulate this concept of state competition, the game provides players with the opportunity to change the opponent's national security agency, thereby changing the resources or game moves available to a player during game play. The wargame also incorporates a defense readiness condition (DEFCON) scale, with certain player actions impacting this scale to greater or lesser degrees and any player driving the scale to DEFCON 1 being the loser. The team also viewed the need to integrate all instruments of national power as critical to the 2018 NDS and designed the game so that each player has three competing national security priorities to balance to achieve win conditions.

Warfighting Function—Information

Though somewhat broader than the warfighting context, deterrence is all about information. Strategic deterrence requires not only a demonstrated capability, but it also requires an understanding of an adversary's perceptions and motivations.[61] Part of the difficulty in understanding an adversary's perceptions and motivations is a tendency to believe that the adversary sees and perceives actions and events either as intended or as the actor seeking to deter would view them.[62]

This disconnect, often described as "mirror-imaging," was prevalent in the context of AA83. Not only did Soviet analysts and policy makers misinterpret President Reagan's approach, but to a significant degree the U.S. policy makers and analysts misunderstood the Soviets as well.[63] While every action sends a message to an adversary, the message received may not be the message intended.[64] Furthermore, in addition to messaging the adversary, other stakeholders

such as the civilian population or regional allies may receive a message as well.[65] This mirror imaging can lead to strategic miscalculation when operating in an environment characterized by imperfect information. Furthermore, imperfect information can complicate decision making when an opponent's goals or outcomes are unclear.[66]

From the warfighting function of information, the team focused on the concept of imperfect information, or the ways in which lacking an understanding of the opponent's win conditions would complicate the player's own decision making.[67] The design team also viewed the larger strategic context in which actions or messages are viewed as critical to this element of game design. Accordingly, the design team created a series of interconnected effects between a player's own cards, as well as between a player's cards and those of the opponent. In essence, a player might foreclose their own actions, or conversely enable actions by their opponent. However, these interconnected effects between players may also be mutually beneficial, resulting in positive outcomes for both players. The design team also included a probabilistic factor into the game, with certain player actions becoming more likely to succeed based upon increases in one of the player's national security priorities or having previously played some other card.

By focusing on these key aspects of the game context, the design team developed the following learning objectives:

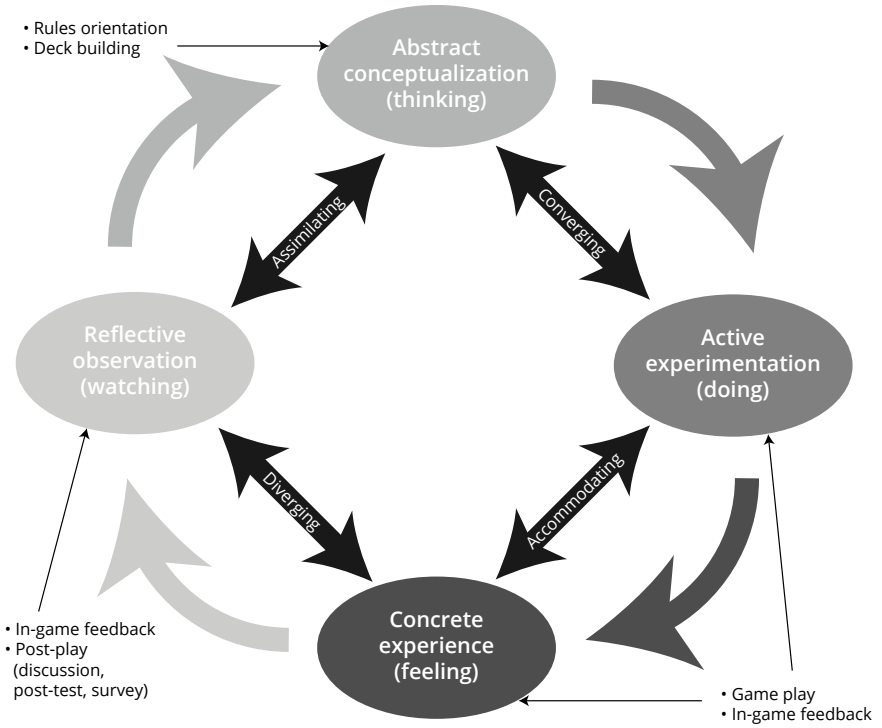
> **Learning objective 1:** player identifies that the execution of a national strategy requires balancing of priorities, risks, and resources across all elements of national power;
>
> **Learning objective 2:** player understands the dynamic and changing nature of the security environment in which actions are taken;
>
> **Learning objective 3:** player appreciates the role of ambiguity/imperfect information in executing a strategy.

With the identification of learning objectives, the next step was to design a wargame to effectively teach students the concepts tied to those objectives.

Linking Game Design to the Learning Cycle

The design team was also able to tie various phases of gameplay to the learning cycle. While not constrained or exclusive to the portions of the learning cycle identified, gameplay phases can roughly be viewed as corresponding to specific parts of the learning cycle. Rules familiarization and deck building can be seen as formulating a strategy or "thinking" about a gameplay approach (abstract

Figure 2. Gameplay phases and corresponding steps in learning cycle/learning style



Source: courtesy of author, adapted by MCUP.

conceptualization). Gameplay and in-game feedback correspond to the "doing" and "feeling" portions of the learning cycle (active experimentation and concrete experience). In-game feedback and post-play reflection impact the "watching" portion of the learning cycle (reflective observation). By incorporating all of these experiences into the game and the assessment tools, the team was able to design a wargame that effectively stimulates each step in the learning cycle and thereby engages each type of learning style.

The student design team encountered a number of difficulties linking game design to the learning cycle. In linking game design to the abstract conceptualization phase, the design team did not initially include the learning objectives in the AA83 rulebook. In hindsight, this appears a rather obvious omission; however, in spurring players to develop their game approaches it proved helpful to include the learning objectives in the rulebook. The design team also struggled to strike the right balance in the time allotted to players to build their decks.

The design team experimented with a limited amount of time to build decks (20 minutes) and permitted players as much time as they would like. Ultimately, once moving into data gathering, the design team settled on affording players an unlimited amount of time to build their decks. Some players

preferred this approach, as it allowed them to be very deliberate in building decks, which provided for complementary or "stacking" effects. However, other players indicated that unlimited time to build a deck was counterproductive and that players could not begin learning until they began playing. On the one hand, an unlimited time to deck build allows players more time to conceptualize a strategy; however, it can bog down players who do not learn best through the abstract conceptualization experience. A limited deck-building time allows players to play more quickly—an attractive proposition to those who learn best through active experimentation or concrete experience; however, it may take several iterations for players to fully appreciate the complex and interconnected nature of game actions in support of learning objectives one and two.

In-game feedback also proved challenging, particularly for first-time players. *Able Archer 83* is relatively complex, and design team observation revealed that first time players sometimes failed to recognize or apply certain effects as described in the rulebook or on various cards. This led several players to indicate that their first play session was spent learning how to play the game, rather than learning in support of the objectives. In this instance, a simpler game design might better support learning in a busy professional military education curriculum. A balanced game design also proved elusive and presented game feedback challenges.

The Soviet player won the vast majority of games. This may indicate that the game as currently designed is unbalanced in favor of the Soviet player. Designing the American player deck to be more complex may not be feasible in an educational wargame designed for a professional military education curriculum in which students may play the game only one or two times. The design team also found that the DEFCON scale was largely a nonfactor, which hampered support of learning objective 2 related to a complex and dynamic national security environment. Future game refinement would include continuing to balance the Soviet and American player decks such that either player is equally likely to win with limited play sessions and to make the DEFCON scale more of a factor to reinforce learning objective 2.

In an effort to reinforce that players were operating with imperfect information, the design team initially included screens to block each player's view of the opponent's game board and national security priority scores. In hindsight, in-game feedback might better reinforce learning objective 3 by removing the screens and allowing players to see the opponent's game board and national security priority scores. Each player would still be blind to the opponent's win conditions and seeing the opponent's score might introduce an element of player bias or distraction by drawing the player's focus toward a single high score rather than taking a holistic view of the game situation.

Finally, as discussed below, the game design team initially neglected the

value of post-play reflection in supporting learning for those who learn best through reflective observation. The post-play assessment and survey used by the design team were of limited utility in this respect, for reasons discussed further subsequently. However, the post-play guided group discussion proved valuable to reflective observation by allowing players to discuss and refine their understanding of the learning objectives and providing players the opportunity to learn from the diverse play experiences of others.

Evaluation of Learning Outcomes in Games

Evaluation of adult learning can often be difficult, in part because effective adult education often involves evaluation that emphasizes comprehension over rote memorization.[68] Another challenge is presented by the fact that experiential learning includes diverse instructional methods and requires equally diverse assessment methods.[69] The drive toward standardization in education pressures educators to assess achievement of educational goals in a standardized way. Despite the wealth of research on experiential learning theory and extensive use of wargaming in professional military education, there does not appear to be a discussion of assessment methodologies for wargaming as an educational tool or an application of those assessment methodologies. This is especially true in the context of adult education, which values teaching concepts as opposed to rote memorization.[70] The goal is to incorporate an assessment model that assesses the utility of the wargame in teaching each type of learner.[71]

While a general discussion of the assessment methodologies used by the design team follows, along with a description of each methodology's strengths and weaknesses, the key concepts that the design team took from this experience are twofold. The first is that the tools used to assess the educational utility of the game, in particular the group discussion, were also a critical component of the educational process. Thus, effective incorporation of wargaming into professional military education should include some form of guided or directed period of reflective observation to stimulate those learning with assimilating or diverging learning styles. With this in mind, it may be appropriate to engage players/students in a group or guided discussion or other period of reflection prior to assessing learning outcomes through other means.

Survey

One promising means of assessment would appear to be post-play reflection or interview of players to assess learning outcomes.[72] This reflection most often takes the form of group discussions, interviews, or questionnaires; however, surveys can also be an effective means of engaging player reflection as an assessment tool.[73] Surveys have a number of strengths as an assessment tool and can provide an accurate perspective as to the relative emphasis or importance

that respondents placed on a particular issue. Surveys are also effective generalized assessment tools when specific information is not required. Protection of personally sensitive or classified information can also be accomplished via survey.[74] Surveys are prone to bias of the respondents and are not effective tools for garnering detailed information.[75] Despite the weaknesses of surveys, they can form a valuable component of a more holistic assessment methodology by connecting with the reflective step of the learning process.[76]

Guided Discussion/Interview

Reflection can also include the use of interviews, and in this case the design team opted for a group guided discussion or after action review.[77] Much as with surveys, the reflective nature of a focus group or group discussion can tie to those who learn through a reflective, observation-driven learning style, as well as those who learn through thinking and abstract conceptualization.[78] This format was chosen not only to assess the preliminary educational utility of the AA83 wargame but also to identify potential future improvements.

Guided or group discussion can complement data gathering during a survey in a number of ways. Group discussions or focus groups are useful in gathering in-depth information and in resolving conflicting or contradictory claims; for instance, when players' educational outcomes vary based on the role played during the game or the specific manner in which gameplay progressed.[79] Group discussions or focus groups can also explain why people conducted certain actions or took certain lessons away from a gaming experience.[80] As demonstrated by the student design team's play-testing, the group discussion can also provide an avenue for students to learn from the experiences of others whose gameplay included different experiences.[81] However, guided discussions or focus groups can be subject to a number of biases based on the relationships between or perceptions of certain group members.[82] Unless the sample size is large enough, it may also be difficult to ascertain if a group provides a representative sample of the relevant population as a whole.[83] Other group member biases may also impact their responses, such as individuals attempting to appear in a more favorable light to the moderator or other group members.[84]

Pre-/Post-Test Assessments

Pre-/post-test assessments can tie educational outcomes to those who learn best through concrete experience and active experimentation by assessing changes or improvements in player understanding of certain concepts through gameplay.[85] The pre-/post-test method's primary strength is in identifying changes in knowledge or behavior as a result of the assessed activity.[86] Post-test assessments can also provide subjective feedback as to the "why" behind changes in player behavior or in identifying game satisfaction.[87] On the contrary, pre-/post-test

methodologies may fail to account for psychological or cognitive differences in players when assessing learning outcomes.[88] Other biases that may present in a post-play testing include the *recency bias*, in which players knew or understood a concept, but perform better on a post-test assessment because the topic is fresh in their mind.[89]

Effective pre-/post-test administration may also require two groups—a test group and a control group to truly draw statistically significant conclusions.[90] Poorly crafted questions may not result in the data sought and may not be fully understood by the students.[91] Pre-test assessments require some previous knowledge or understanding of a concept on the part of students in order to truly assess learning outcomes.[92]

Observation

Observation is another promising assessment methodology for wargaming or other scenario-based teaching methods. This assessment can be either in terms of personal observation or real-time, computer-based data capture.[93] Furthermore, observation in the context of wargaming could be direct or indirect. Direct observation includes real-time observation while the player or person being assessed is aware of the observation.[94] Indirect observation is conducted in an environment where the players are not aware of the observer, providing the benefit of not biasing the players' actions at the expense of being more difficult.[95]

Studies on the utility of observation as an assessment methodology in scenario-based simulations have concluded that scenario-based training provides good educational value.[96] In reaching that conclusion, previous studies have applied two assessment methods. The first was observation of video-recorded performance during the simulation, and the second was reflective interviews with participants. The study concluded, primarily through observation, that students learned both in the performance of "clinically relevant" activities as well as development of emergent behaviors based on interaction with other participants.[97] In essence, these studies identified favorable learning outcomes based on what students were "doing" when engaged in the active experimentation step of the learning cycle. However, the author acknowledges that the study and resultant data collected was in part limited by the amount of time and resources required to complete the study, as well as the focus on more experienced learners as opposed to novices.

Assessment methodologies also included real-time observation of students to assess educational outcomes; however, those have focused on computer-based games separate and apart from the wargaming context or have been applied to pedagogy rather than adult educational models.[98] That said, the use of computer-based, real-time data capture can be viewed as a form of real-time observation

as an assessment tool. In relying primarily on observation, a number of studies have concluded that wargames or serious games have educational utility.[99]

Direct observation, as applied in this context, can provide insight into those who learn through concrete experience or active experimentation learning styles and have the benefit of providing players an uninterrupted setting in which to play the wargame.[100] Furthermore, assuming that the student observation checklist is appropriately crafted, the data gathered through direct observation can indicate real changes in behavior or thinking based on the game context.[101] However, these changes in player behavior may be artificial and not readily translatable to actual practice.[102] Furthermore, under direct observation the players will be aware of the observer, which may present a distraction.[103] Lastly, observation may not provide the "why" for certain player actions.[104] However, there remain gaps in literature discussing the design and assessment of wargaming specifically, as a subset of serious games.[105]

Lessons Learned: Effective Implementation of Educational Wargames

The design team sought to draw on specific observations of student-designed wargame AA83 to draw larger conclusions about the educational utility of wargames, design methodology to produce an effective educational tool, and the best methods to assess learning outcomes of those with various learning styles. Initial data supports two broad conclusions, as well as providing two areas of necessary improvement. The first conclusion is that the game has educational utility, particularly in the areas tied to learning objectives associated with constructing a strategy, integrating all elements of national power, and dealing with a complex security environment.[106] The second conclusion is that three of the assessment tools provided usable and relevant data to assess the educational utility of the game: the student survey, student observation checklist, and the text analysis matrix. Two areas of necessary improvement also presented.

The first area of improvement identified by the student design team is that post-play assessment tools—in the case of AA83 the guided discussion in particular—can provide an integral part of the learning experience in addition to assessment of learning outcomes. The second area highlights two procedural improvements to increase congruence between the team's learning objectives, game design, and assessment tools. Development of these three components should proceed sequentially, completing one component as far as possible, before moving to the next. Additionally, each of those components should be developed iteratively, testing through formal or informal evaluation and refining to ensure that the game effectively teaches the desired learning objectives and that assessment tools effectively gauge how well students learned the desired concepts.

The Value of Post-Play Assessment to Reflective Observation

One of the critical lessons learned for the design team was the importance of post-play assessment to stimulate the reflective observation step of the learning cycle and the corresponding learning styles of assimilating and diverging. The survey provided some degree of reflective value; however, the guided discussion provided a high degree of feedback on both where the game was successful as an enjoyable undertaking and as an educational tool. The most commonly discussed themes related to the ways in which a player's early actions could permit or preclude subsequent options, the necessity to balance efforts across multiple strategic priorities, and the ways in which the player's own strategy was enabled or frustrated by that of the opponent.

The guided discussion also allowed multiple players to discuss and integrate concepts from each other. This group reflection helped illustrate differences between the strategies and approaches each player took, in particular as the U.S. and Soviet player decks are designed to play somewhat differently. The U.S. player deck has more interconnected effects, with a potentially larger "payoff," in an effort to simulate a qualitative capability advantage. The Soviet deck, by contrast, has lower resource costs and less interconnected effects, enabling a faster tempo or decision cycle. It became apparent during a number of guided discussions that, in addition to its utility as an assessment tool, the group-guided discussion is a valuable educational component as a form of group reflection to better integrate the learning objectives.[107]

In addition to the survey and guided discussion results, a number of players commented during their play session that during the first play iteration they were focused on learning the rules and understanding the mechanics of the game. Several players commented during their games that subsequent iterations would allow them to better focus on achieving their strategic priorities, balancing risks and opportunities, and assimilating the learning objectives. This conclusion is supported by observation of subsequent play.

Complementary Design of Curriculum, Game Components, and Assessment Tools

It is also critical for all curriculum and assessment materials to be complementary in both concept and verbiage. Learning objectives and assessment tools, in particular the pre-/post-test for the wargame AA83 were taken from the identified game context documents as well as CSC course cards related to strategic decision making.

As the game only reached the prototype stage, game design does not appear to have fully supported the learning objective related to an ambiguous information environment and the ways in which imperfect information can complicate decision making. In addition, specific terminology in the post test was not sim-

ilarly incorporated into the game.[108] Because the learning objectives and pre-/post-test used language that does not appear in the game materials, there may be some question as to both whether—and how effectively—the game teaches those concepts. To effectively teach the learning objectives as well as assess educational outcomes, all elements of the curriculum, game, and assessment strategy should complement one another. This can be achieved through adoption of a combination of sequential and iterative approaches to all elements of the wargame and its assessment methodology.

Sequential and Iterative Approaches to Game Design and Assessment Methodology

Continued refinement and iteration of the game and assessment tools should follow each play-test session. In the interest of data consistency, the design team decided to forego adjusting the assessment tools after each data-gathering play-test session. This was despite the fact that it became apparent relatively early in the assessment phase that there was a lack of consistency between the game and the pre-/post-test. Another way to remedy this would have been to conduct more nondata gathering play-tests while maintaining an eye toward the assessment tools. This approach would likely ensure better linkages between learning objectives, game design, and assessment tools, in particular ensuring that the larger curriculum, the game, and assessment tools use the same terminology.

Another potential solution would be to develop the assessment tools once the game design is finalized. The student design team was somewhat constrained by the timelines of the academic year, as well as the need in several instances to conduct activities virtually because of CSC or other health protection concerns. This resulted in the team attempting to develop the game context/scenario, learning objectives, overall game design, and assessment methodology in parallel. While continued iteration of all of these various aspects would certainly have contributed to a better product, a sequential approach would have been preferable. The preferred course of action would have been to settle on the educational objectives and game context before moving on to game design and to finish the game design prior to developing the assessment methodology and tools.

Design of an educational wargame must begin with the overall curriculum and clearly stated learning objectives. Once these are settled, the design team should move on to game design and design game components and mechanics to complement those learning objectives. When the game design is finalized, the design team can develop the assessment tools and methodology and clearly link those assessment tools to game design and thereby to the learning objectives. In the student design team's experience for AA83, constructing the game and the

assessment tools in parallel contributed to the difficulty in coordinating these efforts.

Conclusion

Student wargame AA83 provides educational utility in teaching concepts related to strategy, balancing of instruments of national power, and the role of ambiguity or imperfect information in state competition. The game accomplishes this through engagement of all four learning experiences. Rules familiarization and deck building stimulate those who learn best through abstract conceptualization. Concrete experience and abstract experimentation are engaged primarily through gameplay and in-game feedback, while reflective observation is engaged primarily post play through the post test, survey, and guided discussion. Therefore, the assessment tools used to determine the educational utility of AA83 are also a critical component of the educational experience by engaging all four learning experiences and thus accommodating multiple learning styles.

The wargame AA83 is also in need of refinement. It could better coincide with the learning objectives, and the assessment tools could better correspond to the wargame. This disconnect in substance and terminology contributed to suboptimal assessment data and likely a less than ideal educational utility. An effectively designed wargame should implement two procedural improvements to remedy these issues. First, the design team should take a sequential approach to the development and clarification of learning objectives, game design, and assessment methodology. Each component should be developed as close to final form as possible before moving on to the next. Conversely, an iterative approach to the design of each of these components is critical as more data and insights are gathered from play-testing and preliminary or informal data collection and assessment, thereby improving the utility of each specific component.

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Assessment Strategies for Educational Wargames

Kate Kuehn

Abstract: Purposeful integration of assessment within educational wargame design is increasingly essential as military education expands those activities within its curriculum. This multimethod case study examines key challenges and strategies for assessment within educational wargaming practice. Drawing insights from faculty interviews, academic documents, and faculty meeting observations, the study identifies six key assessment challenges: gamesmanship, lack of control, multiple faculty roles, receptiveness to feedback, evaluation of individuals in teams, and fairness of evaluation. It then discusses how experienced faculty mitigate these challenges throughout the assessment design process from identifying outcomes to ensuring the quality of evaluation.
Keywords: wargaming, assessment, professional military education, PME, authentic learning, case study research

The chairman of the Joint Chiefs of Staff has directed an increase in authentic assessment in Joint professional military education (JPME) curriculum, with particular emphasis on activities like wargaming.[1] At the same time, Service-level leaders, including the Commandant of the Marine

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Corps and secretary of the Navy, have directed expansion of wargaming in professional military education curriculum more broadly.[2] Wargames (i.e., artificial competitive environments in which individuals or teams develop and then test the effectiveness of their solutions to complex problems) are often considered authentic learning tools in a PME context.[3] The newest *Officer Professional Military Education Policy* places a heavy emphasis on authentic assessments that simulate real-world applications, with an intentional focus on documenting and evaluating student mastery of key learning outcomes.[4] The purpose of professional military education is to facilitate a student's transition from one career stage to the next by synthesizing their experience with new knowledge and skills. PME institutions balance educational and professional imperatives, seeking to both foster higher-order thinking skills and ensure that those skills transfer into each student's ability to perform certain concrete competencies (i.e., job tasks) after graduation.

There is a long history of wargaming in educational contexts, but Yuna Huh Wong and Garrett Heath specifically highlight a gap in connecting wargaming practice to teaching and learning theory.[5] Their article contributed to an ongoing debate in the Department of Defense (DOD) community about the expansion of wargaming within the military education enterprise, raising questions about the quality of wargaming, organizational and workforce capacity to support the mandated growth, and, important to this article's discussion, understanding wargaming as a learning activity. Meaningful and valid assessment of learning activities aligns theory, task, and evaluation criteria and is essential to high-quality educational practice.[6] To capture and assess learning in wargaming, this gap must be filled. There is also a dearth of published research on the assessment of educational wargaming. Some literature addresses approaches to facilitation within and shortly after game play, but not in the context of accomplishing high-quality learning assessment. Compounding that challenge to assessment design is the complexity of the wargaming environment with its many possible outcomes and data sources.

The author's research seeks to better understand challenges and strategies for assessment within educational wargaming, employing an exploratory case study approach integrating information using multiple methods to develop a rich picture of wargaming assessment practices within the selected context.[7] It draws insights from three major sources: faculty interviews, academic documents, and faculty meeting observations.[8] By examining the perspectives and enacted practices of experienced faculty within wargaming, this study seeks to identify strategies that can serve as useful teaching tools for other faculty as well as contribute to broader theory about designing assessment in such spaces. The article begins with a discussion of considerations for assessment design and implementation within a wargaming context. After outlining the research

question and method, the article then explores assessment challenges in this complex learning context. It concludes with key strategies for mitigating these challenges and implementing effective assessment of wargaming.

Assessment Principles in a Wargame Context

This section provides a framework for designing and dissecting assessment within learning activities, briefly outlining some fundamental principles of assessment design and implementation that are important to consider in any learning context. It then extends that lens to the literature on wargaming and its educational functions within PME.

Principles of Assessment Design

Grant P. Wiggins and Jay McTighe argue that the form and function of learning activities and assessments should be driven by the desired learning outcomes or results (i.e., backward design).[9] In essence, a learning activity should be designed to produce the results and desired evidence of learning that is being sought. Each assessment serves its own function within the curriculum: formative assessments focus on feedback and improving future performance, while summative assessments often produce a score or grade for an academic record and document to what degree students did or did not achieve the desired level of mastery.[10]

Building on the principles of backward design, learning assessment has its own design rules that provide a framework for designing new assessments and for understanding (or improving) how assessment functions within an existing learning activity. Systematic analysis of an assessment design should consider:

1. The desired learning outcome and associated performance expectations;
2. Each activity where that outcome and its associated behaviors are best observed;
3. The tool(s) most appropriate for documenting observations in reference to performance criteria and consistent with the assessment purpose; and
4. The quality, or validity, of each assessment within the activity context.

While the first three are relatively straightforward, the quality of assessment requires elaboration. Assessment quality is first and foremost judged by its content validity. John Gardner defines a high-quality assessment as one that has a clearly defined outcome, which each student has the opportunity to demonstrate.[11] Additionally, he emphasizes that the assessment must have clear criteria or standards for student performance. Finally, the end product of that assess-

ment must be meaningful and actionable. For a formative assessment, meaningful feedback informs future student improvement and teaching strategies. For summative assessment, actionable feedback informs program evaluation and external understanding of a student's level of mastery. The ability to reproduce the same rating using the same assessment instrument to evaluate the same performance constitutes reliability.[12]

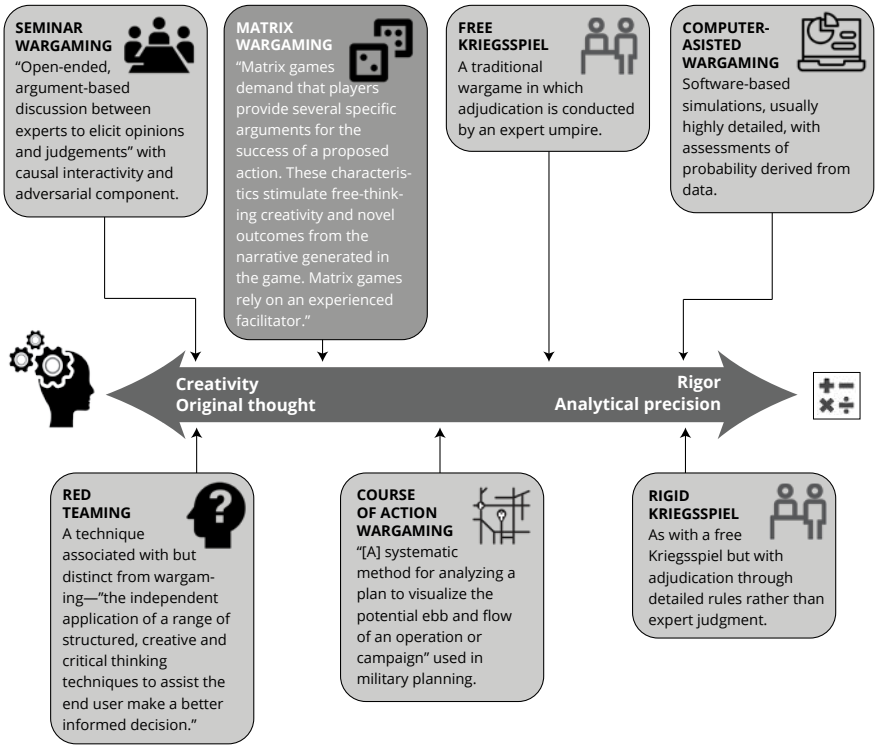
Assessment of Wargames

Resources and guidance on military wargaming emphasize the variety of purposes and values of wargaming that fall within three broad categories: analytical, educational, and experiential.[13] Some characterize wargaming as the basis for testing and refining military concepts and capabilities, some as a tool for structured thinking, and some as a means of experiencing new or hypothetical environments to examine motivations, actions, and consequences.[14] In other words, a wargame can provide a whole host of different functions: examining the likelihood of a plan's success based on the probabilities built into the simulated environment, revealing the gaps and strengths of a planning process and its assumptions, forcing perspective taking to better understand an adversary's thinking, creating a shared experience of cause and effect within a complex environment, etc. A game can, and likely will, provide many of these functions; however, the game and its assessment will be designed differently based on which function has primacy. When conducted for learning, educational wargaming must be aligned to learning outcomes and connected to the broader curriculum.[15]

Literature on wargaming in education falls into two major categories: the first, often published on popular military blogs, captures reflections from faculty who are using wargaming in the classroom.[16] The second focuses on design and implementation of wargames, looking at different game types and structures.[17] Often this second category addresses both educational and analytical wargames. Assessment discussion often has an analytical rather than an educational focus, examining the feasibility of a plan rather than the particulars of learning or student performance in the activity. As an educational tool, these authors often reference serious games and/or game-based learning, but discussions focus more on the concrete activity than on how learning occurs within the environment (i.e., game-based learning).

Wargaming encompasses a wide variety of different game types for which there are many different taxonomies based on level of war, modality of game (e.g., digital), player freedom (rigid to free), level of abstraction or fidelity, type of system (open or closed), and how game outcomes are determined (i.e., adjudication style).[18] These structural features shape how players behave and,

Figure 1. The relationship between wargame structure and game outcomes



Source: courtesy of author, adapted by MCUP.

therefore, the types of outcomes that they demonstrate. Focused on the level of creativity expected in the final outcome of a game, Neil Ashdown's adaptation of the United Kingdom (UK) Ministry of Defence *Wargaming* and *Red Teaming Handbooks* in *Jane's Intelligence Review* makes an explicit connection between different game styles and the type of solution that a game designer is looking for, with the rigid end of the spectrum seen as more precise and objective (figure 1). Game-based learning literature draws similar conclusions about the relationship between structure and learning outcomes, with greater rigidity or directedness in terms of a solution to a problem (or game outcome) better suited to conveying rather than creating knowledge.[19] An organizing principle of selecting a good game for education is that the game should align with the content, level of warfare, and learning outcomes targeted by the activity.[20]

These game features also shape what assessment tools can be integrated into the activity and what data will be available to inform that process.[21] Assessment in a game environment must adapt to the different rules and tools available

in that activity setting. A competitive game has multiple, dynamic sources of data, garnered from game outcomes, within team interactions, between team actions and reactions, faculty facilitation, team decisions, and/or products, etc. Depending on the targeted outcome, assessment can integrate data from any of these sources, preferably while minimizing disruption to the teaching and learning process.[22]

Research Question and Method

Wargaming, with all its varying manifestations, offers a complex task environment with unique challenges for the design and implementation of high-quality assessment. This multi-method case study examines faculty perspectives of assessment in wargaming and associated curriculum, with a particular focus on the challenges and strategies for assessment of team-based (i.e., collaborative) adversarial wargames.

Faculty interviews served as the primary sources for insights into challenges and strategies for conducting assessments of wargames. Interviewees were invited to participate based on their role and experience designing and conducting educational wargames.[23] They had to be directly involved with the design and/or facilitation of an adversarial module for an upcoming educational wargame and had to have taught at the school for at least one full year. Participants included the game leads for two of the departments and two administrators with responsibility for integrating games across the curriculum, representing the diversity of professional backgrounds within the college faculty, including three military Services (U.S. Army, U.S. Air Force, and U.S. Marine Corps) and one PhD civilian faculty member. Each had a diverse background in terms of participating in and conducting games, analytical and educational, in support of DOD requirements. Interviews were transcribed and analyzed for themes regarding assessment challenges and strategies using open coding and then developing axial categories in *MAXQDA*, a qualitative data analysis software.[24]

The analysis also included review of relevant academic documents, including lesson cards (i.e., syllabi), instructor guides, rubrics, and any other game play materials or resources provided to students and faculty for conducting or evaluating each activity. Additionally, the author observed an all-hands "Faculty Wargaming Day," which set the scene for the program's approach to wargaming for the academic year. Adapting Zina O'Leary's document analysis techniques, the author reviewed documents and observation notes to enrich their understanding of the types of games being played, their purpose, and how they were being assessed.[25]

Qualitative studies focus on examining meaning in context, making the importance of gathering the right data (i.e., credibility) and drawing meaning-

ful inferences from that data (i.e., confirmability) essential.[26] As an assessment practitioner at a military education institution as well as a researcher, the author's own professional experiences advising on, and in many cases implementing, assessment activities invariably colored the expectations and interpretations during this research. That said, the focus of this discussion is on the perspectives of the faculty participants, with the analysis trying to make clear the distinction between faculty strategies and the author's own recommended strategies drawn from assessment literature. The use of multiple methods also strengthens the richness and quality of the data collected and can mitigate confirmation bias.[27]

Context

This is a case study of an intermediate-level Service school responding, as many institutions are, to the PME directive to expand wargaming. Following a 10-month program of study, the school confers an accredited master's degree and Joint professional military education-level one (JPME I) credential upon its graduates. At this stage, most students have between 15 and 17 years of military experience and have attained the rank of major, a career transition point from company to field grade officer responsibilities. This school already had a problem-based learning focus that leveraged Socratic-style seminar discussions and learning by doing in the classroom.

Game-based learning activities are also not new; each department has employed gaming in its own way, ranging from individual decision games to informal, scenario-based debates to multiweek planning exercises. Games ranged in length from single seminar discussions (approximately 90 minutes) to multiday activities. Within this school's context, wargames were specifically linked to the development and demonstration of higher-order thinking skills: critical thinking, creative problem solving, decision making, and communication skills. Additionally, games were embedded and scaffolded across the curriculum. In some cases, games themselves were scaffolded, with multiple games in the same format scheduled across the year that address increasingly complex problems. In other cases, games were sequenced within a particular curriculum topic for a seminar, building and connecting on other readings, discussions, and assessments.

This school sought to expand competitive wargaming in particular, where the game must involve thinking players making decisions on both sides of the contested environment. This adversarial wargaming environment is characterized by a dynamic interaction between opposing players/teams in which both sides shape the environment through their actions and reactions. This unstructured wargaming environment falls at the extreme of the spectrum shown in figure 1, presenting unique challenges for observing and evaluating learning outcomes. When played in teams, another frequent and authentic feature of the

program's games, the collaborative aspect of the game adds an additional layer of complexity for both students and faculty assessors.

Challenges for Assessment in Wargames

This analysis identified six key challenges for faculty as they approached assessment in this unscripted learning context. Each of these challenges had particular impacts on the ability to observe, record, and evaluate student performance in a fair and meaningful way. This section provides a review of these challenges.

#1: Gamesmanship

Not unique to wargaming within the game-based learning field, faculty highlighted students' tendency to both game and fight the game rather than focus on the learning process as the first challenge.[28] Students might "game the game" by focusing on how to manipulate the activity rules to maximize points rather than the logic or intellectual reasoning behind a decision. While dissecting a game to detect loopholes does show critical thinking, such lusory focus disrupts both the learning and the faculty members' ability to observe it. All faculty emphasized in the interviews that winning, while the team's desired intent, is not the primary point of the learning activity. In fact, the faculty highlighted that winning can create a faulty assumption that there was one right answer rather than creating a broader realization that decisions are rooted in each context and what is "right" changes. They saw overcoming this challenge as a key faculty responsibility during game facilitation.

Another aspect of gamesmanship occurs when students dismiss game outcomes as erroneous rather than treating them as data to be analyzed or "fight the game." For example, a student team might sustain greater losses than anticipated and attribute it to a flaw in the game. In the extreme, students might dismiss any lessons derived from the gaming experience because they are seen as fixed. This dimension of gamesmanship creates challenges for meaningful feedback and, according to faculty, can also be enhanced by the competitive nature of adversarial wargaming.

#2: Lack of Control

Within the competitive wargaming activity, the two teams playing against one another shape, and are shaped by, the actions of their peer adversaries. Unlike more structured wargames, the games can go in many different directions, bound only by the prespecified objectives for each team and the resources that they have available. As one faculty member observed, there is no reason to recreate history in these particular games; the desire is rather to surprise as well as anticipate your opponent. While this fosters challenge and engagement for students, it means there is less clarity for faculty in terms of achieving the learning

outcome. This puts the onus on the faculty member to continually pull back to the learning outcome without constraining creativity or team dynamics.

With this in mind, faculty must identify outcomes and assessment criteria that are a reasonable expectation of what can be observed across multiple pathways. For example, critical thinking and quality of argumentation can be observed regardless of which course of action a team might select. In a sense, what is assessed is a characteristic of each action or decision rather than the need for a team to select one "correct" answer. At first glance, the clear definition of assessment criteria seems to have more of an impact on summative assessment design, where the desire is to ensure fairness in the final grade and evaluation of each student. But we must also consider the consistency of what will be addressed through formative feedback mechanisms. Formative feedback must provide actionable advice for how students can succeed more effectively in future performances. Such consistency for formative feedback might be established, for example, by establishing a common understanding of how and what is important to emphasize during postgame discussions to ensure all students benefit from emphasis on what school faculty feel is most important.

#3: Multiple Faculty Roles

As an additional complication, during longer wargaming activities, faculty are not present in the room for all team interactions, as they move between each team's room and the adjudication space as they facilitate the game. In essence, faculty can wear up to three hats as they administer, facilitate, and assess. As administrators, they input, gather, and extract game outcomes and gather documentation of each team's decisions. As facilitators, they provide feedback and guidance to each team, interpreting game results after each turn and running postgame discussions to recap the game outcomes. Finally, as assessors, they must also observe individual student mastery of learning outcomes to provide advice for future performance and, when summative, a record of student performance. Compounding this fragmentation of responsibility, many faculty (approximately one-third) will be in their first year of teaching and are newly learning the game rules and expectations. As a result, focus may get pulled to making the game work and ensuring students stay engaged, with assessment as a more secondary consideration. This poses a challenge for assessment in terms of faculty ability to observe, document, and then ultimately evaluate outcomes.

#4: Receptiveness to Feedback

Both the complexity and interactive nature of the competitive wargaming activity can lead to problems when the wargaming ends and the faculty must transition into assessment of that activity. Often students must switch from a high-tempo and relatively autonomous stance to a more reflective and facilitat-

ed learning environment. At the same time, they also have to be open to self, peer, and faculty critiques of their performance.

Varying the length of the activity, the faculty member and students may also become overwhelmed by the amount of data available to them. It becomes challenging to prioritize and zoom in on key learning points within this context. Yet, all faculty interviews emphasized that this formal processing session was the most important part for learning through wargames. Several faculty commented that there was never enough time, but that even with unlimited time, students would eventually reach oversaturation with the amount of feedback.

#5 Evaluating Individuals within Teams

Faculty interviews highlighted the complexity of identifying individual performance within a team setting, which was a core design characteristic of the wargames that were examined in this study. Often, faculty formative feedback would focus on how well an individual contributed to their team rather than on mastery of particular knowledge and skills. In a team, an individual's contribution is shaped by the group's dynamics, decision-making structure, communication style, and, if applicable, the decisions of the team's leader. One faculty member even commented that they included team-based aspects in games to reinforce the challenges of collaborative decision making. Ultimately, group dynamics can obscure individual performance that looks for knowledge or skills beyond their contribution to the team. Students may also be constrained by their assigned roles, with potential impact to what and when to contribute. If evaluating higher-order thinking such as decision making at the individual level, one must see the thinking process of each participant or else make a contentious assumption that the final team decision and observed team conversation reflects each individual's thinking skills.

#6: Fairness of Evaluation

The previously mentioned challenges lead to a larger question raised by faculty about ensuring fairness in summative evaluation, as each of those issues mentioned can complicate the ability to observe each student's mastery. Additionally, in early game iterations, students are themselves learning the rules of the game and, depending on the complexity of those games, their performance may reflect more about their ability to quickly understand game rules than their understanding of key concepts. Evaluation can also impact motivation, particularly if students do not feel that they have a fair chance to succeed, potentially impacting reception of feedback. Every faculty member raised the point about evaluation criteria. Partly in the context of not making expectations too specific and granular, but instead focusing on overarching skills. This recommendation

was reflected in the rubrics used by two of the departments. The exercise-based game, for example, was evaluated by a rubric that examines planning (planning process, theory, and doctrine), problem framing (critical and innovative thinking), problem solving, risk management, and leadership (leadership and communication).

Some faculty comments also indicated that interviewees were not entirely satisfied with the evaluation approach, seeing the need to continue evolving what is evaluated and when. In particular, they raised the challenge of ensuring that rubric criteria connect to what is most important during the new adversarial module and adapts as the game changes.

Strategies for Assessment of Adversarial Wargames

As experienced faculty members, those interviewed shared their approaches to overcoming the previously mentioned challenges as they approached design and implementation of assessments. The following sections group their strategies by key components of the assessment process in order to give a more holistic picture of how the strategies contribute to a preliminary framework for wargaming assessment design.

#1: Identify the Outcome

Faculty underscored the importance of selecting the right outcomes, previously noted as integral to the backward design process. Both the interviews and the school's wargaming rubrics focused on processes rather than concrete knowledge or information that one might assess using more traditional assessment like a test. Wargaming is a process, and faculty emphasized the importance of using a complex activity to capture something similarly complex such as application and use. An outcome seeking assessment of more specific knowledge might require greater scripting in the game, in-game documentation, or incorporation of a pre-/post-assessment to reliably ensure students have the opportunity to demonstrate that particular element.

The outcomes selected often connected to program-level learning outcomes indicative of the role these activities played in synthesizing the curriculum content. Not surprisingly, one department used the final wargaming activity as a capstone to their curriculum. Two departments developed a department-specific exercise or wargaming-related rubric to assess all gaming activities across the course of the curriculum, allowing students and faculty to track performance improvement across activities as well as see any areas to target for improvement in other aspects of instruction. At the same time, faculty interviewed expressed dissatisfaction with the rubric either in terms of how well it captured the observable performances or in terms of how readily other faculty could grasp and apply that rubric in context.

#2: Observe the Outcome

Faculty members play a critical role in keeping the outcome in focus during the wargaming activity. Faculty can prime students to look for outcomes during the game introduction and link back to them at key intervals. For example, faculty interviews highlighted the importance of the faculty members' role in adjudication to add meaningful interpretation to game results and even provide informal or formal scenario injects (i.e., scripted game events) that help guide the team for the next turn—a form of in-game formative assessment. The postgame discussion is a critical opportunity to recenter thinking on key outcomes while analyzing game date. Faculty emphasized avoiding the tendency to focus on winning and instead focused on key decision points or events, why they happened, and what the implications were for dealing with future problems. The faculty interviewed were still conceptualizing how to best prepare and develop other faculty to conduct such facilitation and assessment. Within the medical education sector, such preparation is often done through a formal training program, which requires faculty to both observe students in the activity and then participate as a student in a full activity run-through complete with an evaluation from experienced faculty. In some cases, the burden on faculty can be reduced by providing additional personnel that allows division of responsibilities for facilitation, game implementation, and assessment.

A faculty member may be unable to observe all team interactions or to elicit what each individual is thinking during gameplay; however, there are natural built-in opportunities for faculty to incorporate such assessment into the game. More specifically, this includes the decision points where a team issues its instructions, the end of a turn where the faculty member briefs the turn's results, and the postgame discussion. Mid-game opportunities take advantage of the flow of information to examine in-stride thinking without significantly changing the pace of the game. Some games occur in the same room, in which case there is little separation between the team decision and feedback stages, but the same naturally occurring opportunities for assessment exist. Faculty may respond with targeted questioning tied to outcomes or even eliciting individual student input. Faculty can even stagger focus on outcome or individual performances across the turns of the wargaming activity by varying questioning or incorporating different documentation requirements. For example, a team's action sheet might be adapted to capture information about reasoning or risk. The faculty member might also take a strategic pause (a.k.a. operational pause), if needed, to clarify understanding or deepen thinking about a key point.

#3: Select the Assessment Tool

There were two principal types of assessment tools seen in interviews and curriculum documents: rubrics and facilitated dialogue. Assessment was conduct-

ed during and after wargaming activities with both formative and summative purpose. No specific tools or guidance existed for faculty notetaking during the activity or for dialogue-based feedback at the turn or postgame stages; however, faculty interviews associated the approach to good Socratic seminar management. The rubrics used for summative evaluation could be used to inform faculty note-taking but were not formally designed for that purpose. Instead, the school used rubrics to enable summative evaluation and grading. At the same time, rubric criteria were used consistently across activities so that each activity's evaluation was summative but also relevant to performance in the next activity.

There were also tools used within the wargaming activities that could be expanded or adapted to provide more in-stride documentation for assessment. Teams fill out turn sheets and set up internal tracking tools to determine courses of action and track key decision points. These could be adapted to align with less observed outcomes.

#4: Quality of Evaluation

Faculty emphasized phasing in summative evaluation across the course of the year to allow students and faculty time to adjust to game-based learning. For games with complex rules that will not be repeated, build in an opportunity to learn the rules prior to measuring performance. The practice of scaffolding games or sequencing games as modules within larger curriculum topics also provides an opportunity for multiple assessment points. This opens up the possibility of having some games play an exclusively formative role, which might allow failure and risk-taking while the subsequent assessment examines individual learning from those mistakes. In later iterations, faculty would expect not to see the same mistakes repeated.

While the faculty used rubrics, each emphasized the importance of looking carefully at each rubric's evaluation criteria within the faculty community to ensure clear and continued linkages between professional expectations and performance evaluation standards. Additionally, faculty highlighted the importance of incorporating the rich data produced in the game environment into the assessment design, leveraging the evidence from that joint experience. One faculty interviewee called it "real time feedback to their decision making" when highlighting the advantage of concrete evidence that games can provide to the learning process as students see cause and effect.

Conclusion

This research, focused on assessment practice and challenges, examined the educational purpose and functions of team-based adversarial wargaming at an intermediate-level PME school. These challenges and strategies were rooted in the context of the complex activities and captured the exploits of experienced

faculty dealing with their design and implementation. The case study method is valuable for capturing experience in context as a particular model for others seeking to address similar challenges within their own contexts. As further research continues this conversation about assessment in complex contexts, additional research would benefit from expanding to include the perspectives of more faculty with different experience levels, wargame designers, as well as students' perspectives.

The faculty members contributing to this research provided important insights into the range of challenges that occur in such complex learning contexts and how those might be mitigated. In particular, faculty highlighted the types of outcomes that are most appropriately assessed by these unstructured spaces and how to maintain focus on them during this kind of activity. Additionally, they highlighted natural inject points for assessment during the wargaming activity, taking advantage of natural seams and feedback intervals within the experience. Finally, they highlighted the need to be mindful of summative assessment and individual performance evaluation within complex group settings with a reminder not to undervalue the formative learning gains accomplished in these spaces.

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Hedgemony
A Wargame to Evaluate Senior Joint Professional Military Education Learning Objectives

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Abstract: The *Officer Professional Military Education Policy* directs Joint professional military education institutions to develop officers who demonstrate critical and creative thinking skills. The chairman of the Joint Chiefs of Staff's intent is to develop strategically minded officers who will "creatively apply military power to inform national strategy, conduct globally integrated operations, and fight under conditions of disruptive change."[1] The wargame *Hedgemony* is unlike most other wargames. Its focus is on teaching defense professionals how strategies are a complex interaction between force development, force posture, and force employment. *Hedgemony* also provides a way in which the Marine Corps War College measures its program outcomes.

Keywords: strategy, learning objectives, force structure, complex, professional military education, PME, resource management, wargame

Introduction

Wargaming at the senior professional military education (PME) institutions is a critical part of the students' education. The learning objectives of the majority of wargames are designed to teach students to both appreciate and succeed in complex campaigns that require innovative

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and creative solutions. The majority of the wargames the senior PME students engage in are both historical and futuristic. However, the Marine Corps War College (MCWAR) mission is to "develop critical thinkers, military strategists, joint warfighters and strategic leaders who are prepared to meet the challenges of a complex and dynamic security environment."[2] The complex and dynamic security environment consists mainly of the management of defense resources, national security strategies, force structures, and national interests. Senior PME institutions should ask the question: *To what extent does the curriculum include active learning activities focused on managing defense resources, force structure, and force posture*? If, as the Joint Chiefs of Staff direct, PME institutions are to leverage wargames and exercises to "develop deeper insight and ingenuity," then it follows that senior PME institutions should incorporate a wargame that focuses less on the battlefield maneuvering and more on the national defense challenges facing the Joint Chiefs of Staff, the Service chiefs, and the combatant commanders.[3] MCWAR incorporated the wargame *Hedgemony: A Game of Strategic Choices* into its curriculum and successfully leveraged it to provide deeper insight and ingenuity in formulating strategy, the management of defense resources, and the risks and trade-offs associated with force structure development and global force posture to protect the interests of the United States in a dynamic security environment.

This article examines the Marine Corps War College's experience with a wargame that offers active learning for its students while emphasizing resource management. It evaluates how well the game met the educational objectives and intent set forth by the Joint Chiefs of Staff for senior-level PME. For two days in the academic year 2021, the students at MCWAR played Rand's *Hedgemony: A Game of Strategic Choices* (yes, with a "d"). *Hedgemony* is a war game focused on connecting policy and strategy, balancing defense modernization and readiness, working with allies, and the ultimate challenge of remaining a hegemon. *Hedgemony* may not be as thrilling as other wargames. However, in the same vein as the adage that amateurs study tactics and professionals study logistics, former deputy secretary of defense Robert O. Work, while speaking on the subject of artificial intelligence, said, "in this environment, amateurs talk about applications and professionals talk about architectures and networks."[4] In the environment of strategy making, professionals talk about resource management, national interests, and force structure and posture. This article highlights the importance of defense resource management in the senior PME curricula and shares MCWAR's experience with *Hedgemony*. This article is structured first to examine the name Hedgemony and its significance to PME education. The following section examines the complex nature of strategy formulation and the necessity for senior PME students to embrace a deep understanding of its nature. The main section of this article examines the lessons learned from playing

Hedgemony at the Marine Corps War College and evaluates the ability of the faculty and facilitators to use the game to reach prescribed learning objectives.

The prescribed learning objectives for the game were: evaluate the elements of conventional and nuclear deterrence by examining historical cases and theory, the force structure, national security strategy, and national defense strategy; evaluate the military and other nations' dimensions of power and challenges to U.S. national interests, evaluating the best use of the military instrument across the full spectrum of conflict to achieve national security objectives; evaluate national strategic guidance, Joint operations, and campaign plans; explain how risks impact the strategic construct of ends, ways, and means; and assess the efficacy of current force development efforts for today's complex security environment and that of the potential future. As with any course, to achieve the learning objectives, the faculty must first ensure the students understand the context in which the lesson lies. The name *Hedgemony* captures much of the context and meaning for the game, and both need to be explicitly understood by the students.

The Name of the Game and the Meaning Behind It

The designers of *Hedgemony* deliberately spelled the title of its wargame to allude to the international relations' concept of hedging. The term comes from the financial world, as "to hedge one's bets." As John Hemmings put it, "the basic assumption is that hedging means a state spreads its risk by pursuing two opposite policies towards another state."[5] In the rule book, the designers of the game address how they decided to give the game the name *Hedgemony* as U.S. defense policy makers are faced with a wide variety of challenges to American interests, and those challenges come from many different areas around the planet. Each challenge is different and requires a unique response. Meanwhile, defense strategists must consider the immediate challenges and those that are most likely to occur in the future. Meeting the needs of U.S. national security issues creates inherent tensions requiring strategists and game designers to think about hedging strategies, similar to strategists in financial investment markets.[6]

The name of the game, *Hedgemony*, implies that there is a hegemon or there is a competition for hegemony as much as it implies hedging strategies. Students at the PME institutions should learn about hegemons and the various international relations theories in which a hegemon is a central element. Students should understand the context of hegemony and the interaction between a hegemon and other states. There are varying definitions of hegemony, but the Gramscian definition gives meaning to both the game and position of the United States in the international system. Antonio Gramsci was an Italian-born Marxist writer imprisoned by Benito Mussolini for his Marxist

writings and opposition to fascism. While in prison, Gramsci developed his concept of hegemony.[7] Gramsci's concept of hegemony is influenced heavily by his Marxist thinking. Hegemony, as Gramsci defines it, is a class that dominates another class through a "subtle fusion of coercion and consent."[8] However, Gramsci eschews reductionism and considers hegemony to be a complex relationship between the classes. The complex relationship between the classes is a crucial framework that is critical to understanding how a hegemon interacts with international actors. The United States came into true hegemony after World War II. Liberal institutions were created and headquartered in the United States. America's only real competition was the Soviet Union. When the Soviet Union collapsed in 1991, the United States had achieved true global hegemony, at least to the extent that the modern international system has experienced. However, the uncontested era of American hegemony did not last, and now the United States finds itself in competition with other states seeking hegemony. The purpose of this section is not to debate the potential hegemonic reach of other states but to make it clear that the United States faces competition in several areas of power. Hegemony often refers to economic power. A state's hard power must underwrite the security necessary to achieve and maintain economic power and leadership to achieve hegemonic economic power. In addition to hard power, a post–World War II hegemon has political power and has a market economy and liberal institutions. The combination of hard power and soft power supports Gramsci's concept of a subtle fusion of coercion and consent. A key lesson learned from the students at MCWAR is the same conclusion by Dennis Florig, who argues that "most of the failures of the policies of the current hegemon come from poor choices rather than an inexorable mechanical process, a better metaphor would be hegemonic overreach."[9]

The game *Hedgemony* was designed by Rand but funded by several key departments of national security. The game was sponsored in part by a wide variety of civilian- and military-led offices. The sponsors range from the Office of the Under Secretary of Defense for Policy to the Joint Staff to several national intelligence agencies.[10] The Department of Defense used *Hedgemony* to help write the 2018 *National Defense Strategy*.[11] MCWAR's program outcome of developing strategists aligns with the objectives of the game. Before a student becomes a strategist, and before the student can take full advantage of the learning offered by playing *Hedgemony*, the student must develop an in-depth understanding of the complexity of strategy formulation.

The Meaning and Complexity of Strategy Formulation

Thinking about and developing strategy at the national level requires a deep understanding of the meaning of strategy. The debate about a suitable definition that encapsulates everything about strategy has been ongoing for centu-

ries. Skipping a history lesson on the venerable thinkers of strategy over the centuries, the most notable and recognizable model for a strategy is the ends, ways, and means model. Jeffrey Meiser acknowledges that this is a useful but simplistic model to describe strategy. However, he is also critical of this model because it is widely used as a crutch and undermines creative and effective thinking.[12] The ends, ways, and means model was codified initially by U.S. Army colonel Arthur F. Lykke Jr. and was first published in *Military Review* in 1989, in which the model was described as "strategy equals ends (objectives toward which one strives) plus ways (courses of action) plus means (instruments by which some end can be achieved)."[13] The Lykke model offers a simplified concept of strategy.

Meiser criticizes how strategists and PME institutions have propagated the model as strategy. He cites Antulio J. Echevarria II, who noted that the Ends + Ways + Means = Strategy model is recognizable to strategists as Albert Einstein's $E = mc^2$ is to physicists.[14] More to the point, $E = mc^2$ is a highly complex and sophisticated equation that shows us that there is an interchangeable relationship between energy and mass. Mass increases with speed. As mass approaches the speed of light, it increases toward infinity. Even in this simplified version, the equation offers many more insights into the relationship between mass and energy. However, the equation is derived from the theory of special relativity. Even though $E = mc^2$ is one of the world's most recognizable equations, this does not mean that it is fully understood by most, and yet likely only fully understood by well-educated physicists and mathematicians. The same can be said for the Ends + Ways + Means = Strategy equation, albeit to a lesser extent. The Lykke model superficially indicates a relationship between ways and means and ends, and that strategy results from combining those elements. Lykke's model does not elucidate the complex nature of the interaction between the three elements. Much like the Department of Energy would not want a nuclear weapon built by someone with superficial knowledge of $E = mc^2$, the Department of Defense does not want its strategists to only have a superficial knowledge of Ends + Ways + Means = Strategy. Instead, the chairman of the Joint Chiefs of Staff, the highest-ranking officer in the U.S. military, issued a policy on officer military education directing PME institutions to develop officers who can "demonstrate critical and creative thinking skills, interpersonal skills, and effective written, verbal, and visual communications skills to support the development and implementation of strategies and complex operations."[15] The chairman's intent is to develop strategically minded officers who will "creatively apply military power to inform national strategy, conduct globally integrated operations, and fight under conditions of disruptive change."[16]

The war colleges educate officers to understand strategy formulation's complex nature and think critically about force structure and posture concerning

national strategic objectives. *Hedgemony* reinforces those learning objectives by actively demonstrating the inherent tensions between limited means and ways in light of the unclear, ill-defined, and often abstract nature of a strategic end or objective.

Strategy and tactics differ in many ways, but most notably, they differ by the nature of their objectives. A tactical objective is clear, well-defined, and tangible. A commander can usually assess whether a tactical objective has been reached. A glance at both of these equations highlights that one is nonlinear and the other linear. If there is one thing that both equations have in common, it is that they both model nonlinear systems. Right away, one should note that strategy is not the product of a linear process. Strategy is developed within and about complex, interdependent systems. Therefore, strategy development or formulation is a process that produces feedback. Strategists must use that feedback to reevaluate and reformulate the strategy continuously. While the Ends + Ways + Means = Strategy model helps one comprehend strategy elements, it by no means adequately addresses the nature of strategy or strategic formulation. It is only helpful to those who have studied strategy and to those practitioners who are strategists. Meiser argues that strategy is a theory. By incorporating the works of Elliot Cohen, Barry Posen, and Lawrence Freedman, Meiser settles on defining strategy as a theory of victory or success.[17] The idea that strategy is more a theory than a plan breaks from the Lykke model and gives the budding strategist a more accurate understanding of strategy's complex and nonlinear nature.

Even though a strategy is inherently complex and nonlinear, the strategist must seek to accomplish an objective. Meiser argues that "defining strategy as a theory of success . . . [keeps] the strategist rooted in the process of causal analysis; it brings assumptions to light and forces the strategist to clarify exactly how they plan to cause the desired end state to occur."[18] A theory is, by most definitions, a causal hypothesis that explains how A causes B. The explanation provides more detail on how the causation occurs, in which case often involves the intervening variables previously mentioned.[19] Students at senior PME need to use their time at school to work through the causality of strategies. Faculty can ensure this occurs through papers, oral exams, and war games. *Hedgemony* is designed for students to develop strategies and for the students to evaluate the extent to which their strategies were successful in causing conditions to change so that the students reach their strategic objectives.

Generally speaking, Meiser's attempts to define strategy as a theory of success or victory are much more helpful and accurate than Lykke's model of ends, ways, and means. If a theory is appropriately framed, it presents causality and is falsifiable. A good strategy will have many elements of a good theory. However, the nature of strategy means that causality is more likely to be hypothesized

rather than theorized. The importance of this distinction lies in the unknown and untestable nature of national security strategies. Van Evera proposes that a hypothesis is a conjectured relationship between A and B, by which one would demonstrate or presuppose that A causes B.[20] A hypothesis, therefore, rests on assumptions.

Assumptions are a significant part of any strategy. Until the strategist receives feedback, an assumption is assumed valid. Assumptions are critical to strategic formulation because a strategist will likely never have enough information to make a perfectly informed decision.[21] A strategist must make informed assumptions. If the strategist makes an ill-informed assumption and puts the strategy in action, the feedback will likely demonstrate that the strategist must reevaluate an assumption. For example, a strategist may assume an actor has the same values or motivations as the strategist and develop a strategy that anticipates behaviors that are unlikely to occur.[22] If this occurs, then the strategy must be reevaluated, reformulated, and reimplemented. Strategy is cyclical, iterative, and nonlinear.

Follow-on Student Billets and Resource Management

War college students are likely to be assigned to a billet on some staff, be it a combatant command staff, the Joint staff, or a Service headquarters staff. Wherever they are assigned, their commanders will wrestle with meeting the needs of national security and the resources allocated to them to do so. This year, a new administration is shaping the national security strategy through the budget. The fiscal year (FY) 2022 defense budget is projected to be much less than previous years. A significantly smaller budget means the Services and the combatant commands must determine how they will meet the national security objectives with fewer resources than previous years. For instance, defense budget analysts and the Center for Strategic and International Studies (CSIS) pose five key areas that will challenge the strategist, combatant commanders, and Service chiefs and secretaries. The Army and Navy face budget reductions that will significantly affect their current trajectory in the near and long term. The Army seeks a more significant role in competition with China. The Army argues that its long-range, land-based fires, missile defense, and global logistics have a role in the Western Pacific. That means the Army will need to trade end strength for more capacity and modernization. The Navy faces similar competing priorities as it tries to determine the number and type of ships it needs for the future security environment. The Services need to determine how it will manage its legacy tactical aviation platforms, how it will maintain them, and how it will replace them. The Lockheed Martin F-35 Lightning II program needs to be reevaluated. The program is far more expensive than when it was proposed. The Department of Defense (DOD) needs to determine the F-35

end strength, but each Service has its requirements and has multidecade plans to procure them and meet their respective missions. Finally, CSIS asks if the new administration can justify the current end strength of the entire DOD.[23]

The 2018 *National Defense Strategy* sought to "defeat aggression by a major power, deter opportunistic aggression elsewhere, and disrupt imminent terrorist and [weapons of mass destruction] WMD threats" while defending the homeland and maintaining nuclear deterrence.[24] To do so required 58 total Army brigade combat teams, 355 Navy ships, about 1,200 Air Force aircraft, and a Marine Corps of 185,000 personnel. There was no description of how the administration determined these precise force levels from the very general description of strategic goals that it was proposing. Unclear force structure calculations are not unusual.[25]

The report continues to analyze other areas that will need to be addressed. For instance, DOD must address the force laydown in Guam and the associated infrastructure costs, nuclear modernization, acquisitions related to the space domain, and the next-generation interceptor for homeland defense.[26] Any general or flag officer is familiar with the dilemmas of meeting the nation's national security objectives and prioritizing how to use those resources. In real life, this is highly complex, and there are laws and processes to guide how the nation's resources are used.[27] *Hedgemony* streamlines laws and processes for purposes of the game, but the dilemmas and decision making are still there. The students must grapple with limited resources and global security requirements. The trade-offs and risks are what make *Hedgemony* such a valuable learning experience.

Lessons Learned from Playing *Hedgemony* at MCWAR

MCWAR played *Hedgemony* as part of its curriculum about midway through its spring semester of the 2021 academic year. The game took place over two days, and the students were split into two different games, each with about 15 players. In each game, the students were divided into a blue team and a red team. The blue team represented the United States, North Atlantic Treaty Organization (NATO), and the European Union. The red team represented Russia, the People's Republic of China, the Democratic People's Republic of North Korea, and Iran. Each side was "presented with a global situation, competing national incentives, constraints and objectives, a set of military forces with defined capacities and capabilities, and a pool of periodically renewable resources."[28] The first day was dedicated to learning the rules, understanding the concept of play, and working out anything that would improve the game for the following day. Dr. Yuna Wong and Sebastien J. Bae facilitated the game, and both had worked at Rand when the game was designed. Dr. Wong is one of the original game designers. Additionally, MCWAR course directors

played as the president of the United States. They served as experts for the blue teams with experience in U.S. national security, the Office of the Secretary of Defense, the Joint Chiefs of Staff, and think tanks. The red teams were assisted by Dr. Amin Tarzi, an expert in Middle East affairs; Dr. Yuval Weber, an expert in Russian affairs; and Dr. Christopher Yung, a China expert and dean of MCWAR. It is important to note that these experts helped to facilitate the game. The students made the final decisions on how the countries they represented would play. They consulted with the facilitators to ensure that the students' moves and strategies were realistic and characteristic of the respective countries.

A red team that genuinely understands the side it represents is critical for the learning experience, so the team of regional experts was crucial to the successful learning experience. The students had studied the various countries represented, international relations, and strategic formulation at the point in the curriculum that MCWAR played *Hedgemony*. To better guide the students, especially those representing the red teams, the regional experts helped the students develop strategies and played in ways that were accurately representative of the countries. The students understood they were to compete against each other and within the likely characteristics of a representative country. However, the regional experts provided both a sense of realism and offered the students ideas they might not have considered. The students had studied the red team countries and were familiar with their patterns of international behavior, with the interests they pursued, and the values they upheld—or did not.

Additionally, the students made realistic assumptions about the behavior of the red team countries, including the type of alliances the countries might pursue, weapon systems they might employ, military capabilities they are developing, and diplomatic pressures they might employ. The students also made assumptions about how the countries relied on cyber warfare and information warfare to achieve their strategic objectives. Balanced with the regional expertise, the red teams acted in realistic ways. Had the students simply acted as wily as they wanted and were not constrained by realistic strategic pursuits of the red team countries they represented, all learning objectives would have been lost. The students playing either the blue or the red teams must be educated to understand the interests of each country and the threats they pose to U.S. interests. This is a difficult task for the faculty to achieve. Relying on regional or country-specific experts to augment the teams creates a more realistic experience and enhances the overall learning experience of playing *Hedgemony*. In the end, the well-educated and experienced red teams and facilitators were critical to achieving the learning objectives.

"I felt like everyone was out to get us, all the time, from every angle," claimed one of the students who represented the United States. It is an accu-

rate statement because life as a hegemon is fraught with endless competition. The idea that competition is ceaseless, especially as a hegemon, also brings to light the purpose of teaching international relations theories to war college students. A game like *Hedgemony* reinforces those learning objectives. It helps the students come to terms with abstract ideas of international relations theories and concrete examples of competition and cooperation. In *Hedgemony*, the students experienced complex relationships among competing states, alliances, and hard choices about force structure and force posture. The students playing the United States learned the challenges of being a hegemon.

Unlike many other wargames that focus on a campaign or battle, *Hedgemony* reinforces the political-national strategy linkages. It reinforces Carl von Clausewitz and his axiom that war is an extension of politics. Clausewitz writes that policy permeates and continuously influences all military action. He goes on to say that "the political object is the goal, war is the means of reaching it, and means can never be considered in isolation from their purpose."[29] War college students study how political interests interact with global international politics and meet the stark realities of passing a national defense budget to achieve those political objectives. *Hedgemony* is designed explicitly for defense professionals to learn "how different strategies could affect key planning factors in the trade space at the intersection of force development, force management, force posture, and force employment."[30] The lessons the students learned from playing the game also reinforced MCWAR's model to guide students through the strategy-making process.

The strategy-making model that MCWAR uses can be found in its recently published *Strategy Primer*.[31] As with all models, this does not reflect reality, but it does "seek to streamline many of the contradictions that [the students] will encounter . . . without actually correcting them. That is the 'art' of the strategist . . . who must often choose between multiple contradictory solutions and approaches."[32] The model is focused on influencing actor behavior necessary to achieve desired objectives. The model begins by considering ways to reach national-level strategic objectives. Resources are considered and will shape the strategy, but the students can start to develop an optimal strategy shaped by ways rather than at starting what is available.

To determine how to allocate resources, force structure, and force posture, the students on each team must draft a strategy. For the U.S. forces, the strategy only involves the DOD. Any national security strategy takes a whole-of-government approach, but the game limits the United States to the DOD to reinforce learning objectives. The game is based on the U.S. strategy. Therefore, it is optimal to play the game near the end of the academic year after the students have had enough of the curriculum at a war college to play *Hedgemony* in a meaningful way.

Additionally, as previously mentioned, one of the course directors at MCWAR role-played as the president to guide the students to develop a strategy. The role-playing president does not seek to influence the strategy but instead acts as a facilitator to ensure that the strategy is sound and realistic. Additionally, the facilitator must set clear learning objectives. The learning objectives can reinforce learning objectives from previous courses and a measure against a PME institution's program outcomes. For example, in one of the rounds, North Korea met its objectives, thereby winning the game. North Korea's strategic objectives were well thought out by the red team, informed by a regional expert, and judged to be highly realistic and likely. The interesting thing was that North Korea's objectives were not unrealistically radical, which allowed North Korea to achieve its objectives without much notice or resistance by the blue team or other red team countries. North Korea won because the blue teams did not fully understand North Korea's limited strategic objectives. Additionally, the North Korean problem set was neither well understood nor communicated by the blue teams. In this case, the entire class was able to see the errors made by the blue teams, debrief the reasons for the errors, and continue the game informed by the errors and with a better understanding of the complex nonlinear nature of strategy.

Conclusion

One of the issues with *Hedgemony* is that the game was designed around the 2017 world. This means that some scenarios and conditions for victory are no longer relevant, and there are scenarios and victory conditions that are relevant but are missing. Faculty members and facilitators can make changes to the game by updating some scenarios to meet learning objectives. The game, however, is complicated and relies on the facilitators having adequate experience in force development and force management. Facilitators should not underestimate the complexity of developing new scenarios but should develop them to meet the learning objectives outlined by the chairman of the Joint Chiefs of Staff.

The chairman of the Joint Chiefs of Staff, through the chairman's staff, directs PME institutions to leverage wargames and exercises. The purpose of this article is not to recommend that senior PME institutions need to exclude traditional wargames and exercises focused on battlefield maneuvering. However, instead, they should include those games and exercises that emphasize the national defense challenges facing the Joint Chiefs of Staff, the Service chiefs, and the combatant commanders and meet the *Officer Professional Military Education Policy* requirements.[33] The *Officer Professional Military Education Policy* outlines six Joint learning areas (JLA), all of which can be assessed in a culminating game of *Hedgemony*.[34] The Marine Corps War College incorpo-

rated *Hedgemony* into its curriculum and successfully leveraged it to provide deeper insight and ingenuity in formulating strategy, managing defense resources, and protecting the interests of the United States in a dynamic security environment.

An entire academic year curriculum is needed to educate officers in all of the JLAs. However, there is an opportunity to observe the students' ability to integrate and apply the JLAs in a strategic setting. This article is not a pitch for Joint professional military education (JPME) institutions to rush out and purchase *Hedgemony*. It is an evaluation of the game that the MCWAR faculty and students played in 2021. More importantly, while many of the wargames played in PME institutions are excellent at manifesting creative and innovative campaign-level play, *Hedgemony* is heavily focused on strategy. A war college student cannot think linearly in terms of Ends + Ways + Means = Strategy and successfully play *Hedgemony*. Students must comprehend current world events, national strategy, threats, interests, risks, and assumptions in a complex interactive system. Therefore, the gameplay results, the lessons learned, and a constructive after-action review will be an indictment on not just the students but on the war college's efficacy of its curriculum and faculty.

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Developing Self-Confidence in Military Decision Making
An Imperative for Wargaming

Colonel Eric M. Walters, USMC (Ret)

Abstract: In his *Commandant's Planning Guidance*, the 38th Commandant charges the Marine Corps with doing more to employ wargaming in education and training. It is not often clear why the Marine Corps needs to use this technique to practice decision making, given other kinds of decisions games, such as tactical decision games (TDGs) and decision forcing cases (DFC). While these other decision-making educational tools have their advantages in honing the communication of estimates, orders, and corresponding rationales, the primary virtue of wargaming lies in the far larger number of decisions players must make in a continuously unfolding situation.

Keywords: professional military education, PME, serious games, serious wargames, educational games, military judgment, decision making, maneuver warfare

In his *Commandant's Planning Guidance*, General David H. Berger assesses that—arguably—the greatest shortfall in how the Marine Corps trains and educates its leaders is in practicing decision making against an independent, hostile will.[1] He further says that, historically, wargaming was designed to

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address this deficiency and the Marine Corps must do much better in employing it.[2]

Warfighting, Marine Corps Doctrinal Publication (MCDP) 1, argues that a bias for action—boldness—is essential in war, and that educating Marines to deal with war's uncertainty, friction, and disorderly nature through action is therefore imperative.[3] Our capstone doctrinal publication explains:

> The essential thing is action. Action has three stages: the decision born of thought, the order or preparation for execution, and the execution itself. All three stages are governed by will. The will is rooted in character, and for the man of action, character is of more critical importance than intellect. Intellect without will is worthless, will without intellect is dangerous.[4]

Wargaming supports developing this bias for action because it forces constant practice of military decision making for all participants, educating individuals and developing trust within the team involved. Wargame participants are immersed into an interactive system that feels animated in a way that readings, graphics, and videos cannot replicate.[5] But most of all, such extensive practice through wargaming grows self-confidence in both the individual Marine and in the unit engaged in it. That self-confidence is the part of individual personal character that enables the will to win.

What Is the Problem?

The Commandant is clear that, while the Marine Corps prizes a bias for action, this is not adequately supported by the learning environment in how we train and educate. Marine schools—as well as operating force and supporting establishment organization training and education sessions—do not effectively and continuously exercise it. Why is this?

Part of the reason for this is that we think we can plan our way to victory. Whatever Marine Corps doctrine demands of Marines in terms of action, Marines appear to hedge their bets through deliberate planning. While intuitive decision making is highly sought after in junior leaders, as Marines become more senior in military rank they learn that sometimes they should resist their immediate impulses. Some situations require them to take the time to analyze the crux of the problem and evaluate potential solutions before deciding on one and putting it into action.[6] Marines easily see this in the substantial amount of time they spend teaching service and Joint deliberate planning processes, as well as in developing the planning products such processes require.

These are often group projects where efforts of a few standout participants are visible, but the abilities of the remainder are harder to observe and assess.

Marines do this because it is convenient, easy, and reflects the real-world planning done in the operating forces. Both instructors and members of the learning audience readily understand the importance and relevance of generating quality planning products. One learns a lot from planning, but there is no way to know ahead of time whether or not the resulting plan will work once in contact.[7]

Comparatively, the Marine Corps bias for action culture in professional military education (PME)—whether in Marine Corps University formal schools or in unit staff training sessions—can look underdeveloped or anemic. To quote the well-regarded American naval theorist Captain Wayne P. Hughes:

> The clearest evidence of . . . deficiency is too much communication—reams of orders and directives which in the planning stage are little more than generalities and exhortations, and which defer too much to the moment of decision.[8]

Hughes's complaint is all-too-familiar to those military people involved in educating leaders and their staffs. This evidence today can be found in thick operations orders and in huge PowerPoint slide presentations that are lauded in classrooms and academic evolutions in the operating forces, leading to the insider joke of overworked military planners that "mass equals validity."[9]

Unfortunately, not enough attention is paid to teaching and practicing decision making during execution of the plan, especially when the plan can no longer work. When it comes time for that "moment of decision" executing in an uncertain and volatile situation, Marines often observe a great deal of hesitation, miscommunication, and confusion. Why does this happen? The Commandant is suggesting it is because Marines lack continuous practice doing this in a free-play situation under severe time pressures.[10] Proponents of unit cohesion, such as Donald E. Vandergriff and Dr. Jonathan Shay, will argue it is because the team members involved in execution do not know each other well; they have not sufficiently practiced together in coping with problems that fall outside the plan.[11] It boils down to trust, and trust is earned through shared experience, a professional ethic, and leadership.[12] To compensate for this, a great deal of very basic information must be explicitly communicated in planning documents, as if trying to cover every situation in writing will suffice.

When executing, often the only way to learn about one's adversary and the environment is to act. The time to plan has passed, and passive observation is not revealing anything important about the adversary. The phrase "move out and draw fire" aptly captures the notion of developing the situation in this way; to develop the situation and find out what is out there, one has to elicit an enemy response that gives some indication of their disposition and intent. While one learns much faster through acting in such a way than in passively watching, it does admittedly entail some dangers!

The Educational Requirement

Marines are told in *Warfighting* that "all professional schools, particularly officer schools, should focus on developing a talent for military judgment, not on imparting knowledge through rote learning."[13] *Learning*, MCDP 7, elaborates on the reasons for this:

> Developing fundamental cognitive competencies such as problem framing, mental imaging, critical thinking, analysis, reasoning, and problem solving enables Marines to make effective decisions more quickly in time constrained environments, when they often have incomplete, inaccurate, or even contradictory information.[14]

While Marines must teach planning, education cannot stop there; we have to then focus on the main task at hand when executing the plan by "making sure our warriors are up to the harshest intellectual demands of combat—making tough decisions under stress."[15] If the proof of these plans is in the execution of them, then we find limitations in the typical capstone evolution showcasing precisely this, a command post exercise (CPX). To be fair, CPXs are not intended to test plans but to practice staff procedures and command post information management. Because of this, they are conducted in "real time"—an hour on the CPX clock directly correlates to an hour of simulated combat. For the largest combined force CPX—Ulchi-Freedom Guardian in Korea—the exercise time allotted is approximately 10 days.[16] While that is enough to practice staffs in their wartime duties, it is far more difficult to evaluate decision making across the participants involved, especially at the operational level of war when decision consequences and implications may not become evident until many weeks or even months later. Time horizons to exercise termination are artificially shallow as participants might accomplish their current mission in a week or two, but at the end of the exercise it is not clear whether the unit will be postured to achieve the next one. Military judgment skills are best in evidence for some exercise billets—commanders and key staff positions—but not so for others. Does the exercise scenario usually render published plans/orders obsolete in short order, forcing adaptation to successfully overcome? Not often, as the situations are usually constructed/scripted to ensure accomplishing predetermined training objectives. Exercises where preformulated plans are rapidly overtaken by events and rendered irrelevant by the actions of a competitive enemy are those where Marines can best observe and evaluate military judgment in action. Even if Marines find this happening in a CPX, they can typically assess decision making in only a few individuals.

Similarly, how can leaders evaluate Marines in an operating force unit in

Figure 1. Marines work at a Command Operations Center during a logistics wargame aboard Marine Corps Base Quantico

Source: official U.S. Marine Corps photo by PFC Samuel Ellis.

terms of *how* they think, not *what* they think? This is especially true when given tight competition for field maneuver areas in garrison, limited facilities aboard ship, and times when not all the unit is present due to other commitments. On top of that, unit training time is at a premium, to say nothing of accompanying hour-consuming administrative, logistical, and other overhead tasks. What about supporting establishment organizations? How might Marine Corps leaders transcend those inherent limitations to educate Marines in military judgment skills? After all, Marine Corps doctrine of maneuver warfare demands it:

> Maneuver warfare is decision making; that is, the application of mission tactics. So the teacher must equip his students to make decisions. Given this, it is decision-making ability that, in maneuver warfare, determines whether or not the unit is successful. Therefore, it is the maneuver warfare teacher's task to develop judgment: judgment that can be applied to decision making. More than content, methodology, or procedures, the task at hand is teaching the student to make decisions. And what better way to teach decisions is there than to require the student to *make* decisions? He must make them repeatedly and often, under a multitude of circumstances, subject to the harshest criticism of his teacher and his peers.[17]

Wargaming as Preferred Solution

Tactical decision games (TDGs) and historical immersion problems (HIPs)—otherwise known as decision forcing cases (DFCs)—develop in a Marine estimative, decision-making, and orders communication skills "subject to the harshest criticism of his teacher and his peers" in Wyly's view. Using such tools, Marines will achieve a high degree of confidence in themselves, both individually and collectively, since they learn how everyone in the team thinks and acts. Individual deficiencies in communicating decisions and the supporting rationale become glaringly obvious, creating a strong incentive to improve. TDGs and HIPs/DFCs are also relatively easy to implement in an indoor, classroom environment. While facilitators running such events need some training, coaching, and practice to do this well, it does not take much time for them to become functionally effective. It is easy to think these kinds of teaching tools will answer the educational requirement mentioned above because they force the participants to make a decision and—through the scrutiny of their peers—learn how well or badly they made it.

The prime limitation of both these methods is the number and pacing of the decisions involved. TDGs typically require a single decision—the solution FRAGO with sketch—and HIPs/DFCs perhaps a handful of judgments at most. This is one of the reasons why *Warfighting* lists wargames as a useful tool for general professional development, to include educating military judgment.[18] Why is this?

Wargaming demands continuous estimates of the situation and a seemingly never-ending series of time-constrained decisions that build on dynamic interaction as forces collide. Wargame participants learn actively, similarly to TDGs and HIPs/DFCs, but wargamers must come up with options, quickly make a decision, execute it, and subsequently assess their thinking when opponents react—and do this repeatedly.[19] Unexpected outcomes, surprises, and revised estimates are commonplace, as are changes in objectives and missions.

The Fuel of Competition

Perhaps the other most compelling justification for wargaming is the idea that these games are competitive; the incentive to improve both as an individual and as a team is the strongest of all. "Competing is a way of thinking," according to *Competing*, MCDP 1-4.[20] There is a natural concern that we should not let participants in the educational environment lose so long as they understand what they have done wrong.[21] Jane McGonigal, a celebrated computer game designer, explains that people put more effort into their gaming than they do into their life *precisely because winning is so hard*.[22] She notes servicemembers overseas spend so many of their off-duty waking hours playing combat video games to win virtual medals.[23] In other words, they spend their free time in

a wargame playing at what they are supposed to be training to do every day. Watching Marines deeply immersed in *Call of Duty 4: Modern Warfare* on their PlayStation controllers for the first few times, one is struck by how quickly they lose and how ready they are to try again. And again!

There are many advantages to gaming, but McGonigal argues the most important is how clearly articulated and well presented the reward and failure system is. Because achieving victory is so clear-cut and so challenging, players willingly devote a lot of time and effort in these games—even in the face of frequently repeated losses—to earn it.[24] Her book argues that we would do better to incorporate competitive gaming techniques and procedures into our lifestyles to motivate more personal effort, even despite the sheer difficulty of winning in adverse circumstances.[25] Defeat is a bruising experience when and where it happens, but like ground fighting in the Marine Corps Martial Arts Program, one gets used to the pain—even the pain of failure.

Fear of failure can be useful. Marines will take on the challenge when they see how their individual decision making and team cohesion improve. If players are willing to play *Call of Duty* games over and over despite losing, they will behave the same way in unit wargaming if the challenge is a worthy one (and fun!). Lost games—if used properly—can be a great way to promote cohesion as teams struggle to overcome the agony of defeat and triumph the next time around. Nothing motivates people to learn more in less time than losing a competition. People naturally redouble their efforts to win the next time around. They cannot wait to get back in the arena and try again. This is what Marine Corps leaders want; this will lead over time to more and more victories, encouraging individual Marines and their units, reinforcing lessons learned in prior defeats as well as adding new insights.

Wargaming Builds Confidence

Like the other decision games mentioned previously, what wargaming does teach is self-confidence. But unlike tactical decision games and decision forcing case method, the feedback is far more compelling; one either wins or loses the wargame and participants are not left with merely each other's arguments for or against a particular estimate, order, or rationale. In wargaming, the player has to take risks and deal with the immediate and far-reaching consequences, learning over time how to do this well. Sometimes a Marine loses, but then sometimes they win. Both are valuable in building a vicarious experience base to increase personal confidence and resilience. From experience comes wisdom. From self-confidence comes character and will—those things talked about in the *Warfighting* quotation. All of this leads to a greater propensity to act in the fog, friction, fluidity, disorder, and complexity of combat—the goal of the Marine Corps maneuver warfare individual mindset and collective culture.

Figure 2. 3d Marine Division challenges junior Marines in a *Memoir '44* wargame tournament

Source: official U.S. Marine Corps photo by Cpl Timothy Hernandez.

Whatever kind of wargaming Marines do—whether it be computer games, board games, role-playing games, live-action role-playing games, or old-fashioned miniatures games using toy soldiers, ships, or planes—the experience of playing draws them into it. It is typically exciting and exhilarating, and the competition between players and teams only adds to that. Best of all, Marines feel like learning is occurring; improvement over repeated plays becomes evident. Naturally, Marines then want to take on more opponents to test themselves against a wider field of competition. Marines continue looking for opportunities to improve, whether they win or lose.

Practicing action to the point where it becomes not only reflexive but best suited to the situation at hand is more than training—it requires education—the business of how to think, not what to think. The more this is done, the better and faster one will be in taking effective action. As Lawrence of Arabia famously advised:

> Nine-tenths of tactics are certain, and taught in books: but the irrational tenth is like the kingfisher flashing across the pool. . . . It can only be ensured by instinct, sharpened by thought practicing the stroke so often that at the crisis it is as natural as a reflex.[26]

This instinctive reflex required to succeed in military decision making can

only come through repeated deliberate practice, subject to careful thought, and not just mere "reps" and "sets." Short of actual combat and major force-on-force field exercises, wargaming is the only other venue that can readily provide the arena to practice constant and continuous estimating, acting, and assessing skills for individuals and groups, and do so at far less expense.[27] To improve, Marines should not practice what they are already good at; instead, they must focus on remedying their deficiencies. Finding out what those deficiencies are also requires an experienced coach to see what is lacking, one who can structure scenarios and select the right kind of venue to challenge Marines, forcing them to repeatedly face and overcome their shortcomings and fears.[28]

For someone who has a grasp of only military history and current doctrine, it is all too easy to hesitate in an ambiguous, uncertain situation. Major General Ernest Swinton's subaltern, Lieutenant Backsight Forethought, in the famous early twentieth century tactical primer, *The Defense of Duffer's Drift*, laments when faced with his basic decision making problem that "I had passed all my examinations with fair success" and "if [only] they had given me a job like fighting the battle of Waterloo, or Sedan, or Bull Run, I knew all about that as I had crammed it all up and been examined in it too."[29] And yet, he is mystified by the situation he is faced with and is not aggressive in coming to grips with it in his first outing against the enemy.[30] It takes five failures in actual practice before Swinton's protagonist gains the necessary experience to master this "knotty problem" and win in his sixth attempt.[31] The famous Prussian reformer, General Gerhard von Scharnhorst, observed:

> I have often seen how pathetic those general staff officers are who draw their advice from their own observed data, how indecisive and timid they are to accomplish anything that . . . the circumstances demand. Such people do not know the risks which must be taken in war. . . . They probably never risk a bold idea, since no similar situation crowned with success in the past gives them the necessary self-confidence.[32]

This is true in competitive educational wargames as well as in battle. It can only be overcome by routinely stepping into the ring and trading punches with a sparring partner. Marines learn to accept that there will be the occasional black eye and bloody nose. Hesitation and fears are not dismissed but are overcome and evaluated much more objectively against the potential gains realized only by accepting a certain level of risk. The most important thing is having experienced success—even if not on every occasion—while taking chances. Wargaming gives its participants those experiences.

Wargaming does this by educating everyone, not just the leaders, about the situation, the "environment," and the "opposition" as well as the interaction of

Figure 3. Exploiting terrain in *Memoir '44* at a 3d Marine Division wargame tournament

Source: official U.S. Marine Corps photo by Cpl Timothy Hernandez.

forces, terrain, and weather—move by move, turn by turn. Quotation marks are placed around the "environment" and the "opposition" as these are most prone to bias due to the limitations of wargaming, either in a computer chip, a rulebook, or on a map. These portrayals are "like war" but not "war," as nothing can come close to approximating the danger and stress of battle. One must always keep this in mind. When determining what works and what does not work, a comparison to combat history and actual practical application is prudent. Validating anything from wargame experience alone is not recommended. Marines will need the benefit of historical hindsight and actual execution in the field in exercises and—especially—in combat.

It is easy to narrow one's attention on the science of war, achieving technical competence in employing arms and technology to solve military problems. That is necessary but not sufficient alone for success in combat. Marines must master the art of war as well.

> Art can be developed, but like hitting a curve ball, it takes a bit of innate talent, too. One day, if you have it, you look at a situation and you get the picture. Some folks, even very senior officers, never get it. These men, often very bright, insist upon learning all the proper buzz words, and chant them repeatedly, as if saying them enough would somehow impart understanding. Despite Benning, Leavenworth, and all the books, such

> people never quite bridge the gap between theory and practice. They look, but do not see.[33]

Wargaming Grows Competence

When obtaining actual combat experience is not possible, wargaming provides the best and most accessible avenue to get the needed practice to obtain a rudimentary level of competence in military decision making. Tactical decision games and decision forcing case method have their place but involve less frequent decision-making practice to emphasize communication skills in issuing orders and explaining rationales. Wargaming can do these things as well in multiplayer team games without sacrificing the never-ending stream of continuous decisions participants must make. The games themselves, whether manual or computerized, are relatively cheap, portable, and easy to set up and run compared to larger military force-on-force field exercises. A considerable side benefit of this is gaining an ability of learning how to learn. Continuous practice in peacetime is far preferable to the expensive proposition of doing so in war.[34]

The problem with wargaming, because it is so immersive, is that this vicarious experience alone—without learning combat/military history, doctrine, and simultaneously reflecting deeply on the relationship between them—can be misleading, resulting in a heavy dose of vividness bias.[35] Historical and doctrinal knowledge alone is not enough without the education that practice—either in actual combat or vicariously in wargames—can provide. However, wargaming alone without the benefit of informed reflection on the strengths and weaknesses of the models used, is not desired either. This is what separates wargames intended purely for entertainment from those designed as serious games to educate the player.[36]

That said, even the stress of simulated conflict will reveal to participants a great deal about everyone involved and shatters an oft-overlooked cultural paradox: seniors and subordinates typically have diametrically opposite perspectives on what the cause is for effective action under the duress of combat. To quote Captain Hughes:

> Draw any good naval leader . . . into a conversation on his experience . . . and it will quickly come out that the tactical plan imposed by his seniors was to his mind too rigid. He will tell you how he maneuvered more cleverly and fired his weapons more effectively than . . . prescribed. In the next breath he will tell you how when he was in command his units moved together like clockwork. He will swear to you that all his captains knew exactly what each teammate would do as instinctively as a basketball player knows from body language which

> way his teammate will cut. It will never occur to the speaker that there is the slightest inconsistency in his account.[37]

This illustrates the implicit paradox embedded in our military culture, best evidenced in the way military members think about command and control. When acting as a subordinate, Marines think they can do a better job than their seniors intended. "Don't confine me inside your box!" subordinate leaders think. Yet, when Marines are the higher-level commander, they think they have the organization operating at peak efficiency and that the team does its mission seamlessly. Many military leaders with long experience—upon hearing the thinking of subordinates—will disagree: "I don't confine my people in a box; they work as a synchronized team." Wargaming actively challenges these perceptions on both sides of the paradox, forcing both senior and subordinate to reconcile such opposing viewpoints to succeed. Most of all, wargaming challenges the self-image bias that both senior and subordinate leaders may harbor:

> The greatest determinants of victory are the very things that commanders will judge most badly: their own attributes and reputation. All good combat leaders are highly competitive; unfortunately, so are most bad ones. Under the circumstances, the best counsel is this: The untried commander should assume that he or she has average skill and not presume that he can overcome disadvantage with talents he may not possess. If a commander has talent, it will grow.[38]

One can only reconcile the paradox and grow personal talent by learning; each individual learns about the situation and everyone on the team learns about each other. Such learning occurs to a degree that reams of detailed orders aiming to cover every conceivable contingency are not needed. The unit and its members are competent individually and collectively in making decisions in uncertain and complex situations. Moral force in an individual and across a team is partly a product of effective, top-quality training that is realistic and challenging, which means it is difficult.[39] Like actual war and warfare, it is competitive, with defeat a possible (and—particularly at first—frequently likely) outcome. If Marines think of shared experience in combat as something that both teaches participants about military judgment (achieving competence) and strengthens the bonds between unit members (achieving confidence and cohesion), Marines can then assume that shared experience in wargames, especially those played in teams, could do something similar. This is true even though wargaming lacks the dangers and physical fear so pervasive in battle.

Conclusion

Wargaming best supports developing the bias for action so essential to success in maneuver warfare, and it is understandable that the Commandant desires to see it employed on a wider and more frequent basis. Not only are wargame participants thoroughly engaged in problem solving in a dynamic, interactive way, the experience lends itself to explaining and evaluating why and how Marines make military estimates and decisions. The educational value of wargaming benefits both formal Marine Corps PME and unit training but also has the effect of creating cohesive bonds as Marines learn about how their teammates think and react in a dynamic, competitive environment.

The result? Greater self-confidence in the individual, who has many hours of experience in coping with fast-moving, ambiguous situations, making timely and considered decisions even in the face of obstacles. When those decisions turn out to be wrong and a loss ensues, the individual is used to adapting to adversity and learning from the situation, aiming to do better next time. For units, not only will its members benefit as individuals per the above, but the team knows itself well, communicating to each other before, during, and after each contest with the sure familiarity and trust that only such collective experience in competition can provide. Wargaming provides the arena for such competition; why not embrace it and use it?

Endnotes

1. Gen David H. Berger, *Commandant's Planning Guidance: 38th Commandant of the Marine Corps* (Washington, DC: Headquarters Marine Corps, 2019), 19.
2. Berger, *Commandant's Planning Guidance*.
3. *Warfighting*, MCDP 1 with change 1 (Washington, DC: Headquarters Marine Corps, 2018), 2-20, 2-22, 2-26, 3-6–3-7.
4. Hans von Seeckt, *Thoughts of a Soldier*, trans. Gilbert Waterhouse (London: E. Benn, 1930), 123.
5. Philip Sabin, *Simulating War: Studying Conflict through Simulation Games* (New York: Continuum International Publishing Group, 2012), 63.
6. Daniel Kahneman, *Thinking, Fast and Slow* (New York: Farrar, Strauss and Giroux, 2011), 44–49; and Dietrich Dörner, *The Logic of Failure: Recognizing and Avoiding Error in Complex Situations* (New York: Metropolitan Books, 1996), 153–83. Kahneman describes the perplexing issue of knowing when to rely on intuition ("thinking fast") and—the purpose of his book—when not to ("thinking slow"); Dörner is sympathetic to this argument but also describes the perils of overanalyzing and other cognitive errors in planning when "thinking slow."
7. Helmuth von Moltke, "Second Part: Article from 1871 on Strategy," *Moltke's Military Works: II. Activity as Chief of the Army General Staff in Peacetime* (Berlin: Ernst Siegfried Mittler und Sohn, 1900), 291; Dwight D. Eisenhower, "Remarks at the National Defense Executive Reserve Conference: Date, November 14, 1957," *Public Papers of the Presidents of the United States, Dwight D. Eisenhower, 1957, Containing the Public Messages, Speeches, and Statements of the President* (Washington, DC: Federal Register Division, National Archives and Records Service, General Services Administration, 1958),

818. Notable planners/commanders warn against prescriptive planning. Helmuth von Moltke (the "Elder") wrote: "No plan of operations extends with any certainty beyond the first encounter with the main enemy forces. Only the layman believes that in the course of a campaign he sees the consistent implementation of an original thought that has been considered in advance in every detail and retained to the end." Eisenhower's observation was that "plans are nothing, planning is everything."

8. Capt Wayne P. Hughes Jr., USN (Ret), *Fleet Tactics and Coastal Combat*, 2d ed. (Annapolis, MD: Naval Institute Press, 1999), 31.
9. The author heard this phrase in his first MAGTF Staff Training Program (MSTP) MEFEX in 2000 during the orders generation process. Significantly, MSTP officers were quite good at closely reading the resulting products despite their voluminous nature, pointing out that these were usually not well integrated. Individual major subordinate command orders often contained disconnects between them as well as within themselves.
10. Berger, *Commandant's Planning Guidance*, 19.
11. "More on Trust and Betrayal—Dr. Jonathan Shay," Missing Human Manual, 24 June 2011; and Ardant du Picq, *Battle Studies* (New York: AMS Press, 1991), 110. Shay, a psychiatrist working with Vietnam War veterans and author of the acclaimed *Achilles in Vietnam*, focuses on the need for cohesion and trust in a dangerous world, which is a necessary ingredient for success in human pursuits of any kind. An aphorism by Col Ardant du Picq is usually cited as an illustration of this: "Four brave men who do not know each other will not dare to attack a lion. Four less brave, but knowing each other well, sure of their reliability and consequentially of mutual aid, will attack resolutely."
12. *Warfighting*, 3-7.
13. *Warfighting*, 3-12.
14. *Learning*, MCDP 7 (Washington, DC: Headquarters Marine Corps, 2020), 1-6. See also the accompanying endnote 7, citing *Warfighting*, Notes-1.
15. Michael Duncan Wyly, "Teaching Maneuver Warfare," in *Maneuver Warfare: An Anthology*, ed. Richard D. Hooker Jr. (Novato, CA: Presidio Press, 1993), 263.
16. "Ulchi-Freedom Guardian," GlobalSecurity.org. The author was the Combined Force Command/United States Forces Korea C2/J2 exercise planner for its predecessor, Ulchi-Focus Lens, 1995–97, and a participant in 1994, 2000–1, and 2004–6.
17. Wyly, "Teaching Maneuver Warfare," 251.
18. *Warfighting*, 63.
19. Philip Sabin, "Wargames as an Academic Instrument," in *Zones of Control: Perspectives on Wargaming*, ed. Pat Harrigan and Matthew G. Kirschenbaum (Cambridge, MA: MIT Press, 2016), 424.
20. *Competing*, MCDP 1-4 (Washington, DC: Headquarters Marine Corps, 2020), 5-13.
21. Kris Osborn, "Army Will Soon Conduct a 'Wargame.' And Losing Is 'Seen as a Great Development'," *National Interest*, 8 November 2018. There is a perceived stigma in publicly losing; the author has seen this in discussions with peers and colleagues regarding whether or not wargame novices in class should continue to play a game they are losing. Those advocating this reason say the risk of turning off participants to the value of wargaming is high if losing is allowed to occur. The issue revolves around whether or not participants have already absorbed the lessons they should learn and do not need to play on ("rubbing their noses in the dirt") to eventually lose. Osborn's article contains suggestions that one needs to experience the loss to fully learn something not known beforehand.
22. Jane McGonigal, *Reality Is Broken*: *Why Games Make Us Better and How They Can Change the World* (New York: Penguin Press, 2011), intro. and chap. 1, Kindle.
23. McGonigal, *Reality Is Broken*, intro.
24. McGonigal, *Reality Is Broken*, chap. 1.
25. McGonigal, *Reality Is Broken*.
26. Col T. E. Lawrence, *Seven Pillars of Wisdom: A Triumph* (New York: Doubleday, 1926; repr., Mannituck, NY: Amereon House, undated), 196.
27. Matthew Cox, "Army Focus on Combat Training Center Rotations 'Unsustainable,'

General Says," Military.com, 13 October 2020. The best force-on-force live field exercises, such as rotations into the U.S. Army's National Training Center at Fort Irwin, CA, are those on instrumented ranges so that participants can conduct detailed critiques on their decision making watching replays of the battle on electronic displays; these have traditionally also been called wargames. Such events only rarely happen, such as once a year, for a specific unit, and recently have been reduced in frequency given other competing priorities in unit operational tempo.

28. Geoff Colvin, *Talent Is Overrated: What Really Separates World-Class Performers from Everybody Else* (New York: Penguin Group, 2010), 66–72.
29. MajGen Ernest Swinton, *The Defense of Duffer's Drift*, Fleet Marine Force Reference Publication 12-33 (Washington, DC: Headquarters Marine Corps, 1989), 12.
30. Swinton, *The Defense of Duffer's Drift*.
31. Swinton, *The Defense of Duffer's Drift*, 61.
32. Charles Edward White, *The Enlightened Soldier: Scharnhorst and the Militarische Gesellschaft in Berlin, 1801–1805* (New York: Praeger Publishers, 1989), 91. See accompanying endnote 19, 115, for the original source, Rudolf Stadelman, *Scharnhorst: Schicksal und geistige Welt, ein Fragment* (Wiesbaden, Federal Republic of Germany: Limes Verlag, 1952), 155–56.
33. Daniel P. Bolger, *The Battle for Hunger Hill: The 1st Battalion, 327th Infantry Regiment at the Joint Readiness Training Center* (Novato, CA: Presidio Press, 1997), 88.
34. Frank G. Hoffman, *Mars Adapting: Military Change during War* (Annapolis, MD: Naval Institute Press, 2021), 258.
35. Richards J. Heuer Jr., *The Psychology of Intelligence Analysis* (Langley, VA: Center for the Study of Intelligence, Central Intelligence Agency, 1999), 116–19; and Christopher A. Weuve et al., *Wargame Pathologies* (Alexandria, VA: Center for Naval Analyses, 2004), 33. Heuer describes this bias as "information that people perceive directly, that they hear with their own ears or see with their own eyes, [and] is likely to have greater impact than information received secondhand that may have greater evidential value." Weuve et al. write of the problems that participant personal experience that vividness bias reflects can also "lose the forest for the trees" as they relate their game experience to what they have already seen, know, and will be comfortable with.
36. David Michael and Sande Chen, *Serious Games: Games that Educate, Train, and Inform* (Mason, OH: Course Technology, 2006), 17.
37. Hughes, *Fleet Tactics and Coastal Combat*, 31.
38. Capt Wayne P. Hughes Jr., USN (Ret), and RAdm Robert P. Girrier, USN (Ret), *Fleet Tactics and Naval Operations*, 3d ed. (Annapolis, MD: Naval Institute Press, 2018), 242.
39. Also routinely characterized as "first-class" or "first rate" in advice from Field Marshal Erwin Rommel: "The best form of 'welfare' for the troops is first-class training." Erwin Rommel, *The Rommel Papers*, ed. B. H. Liddell Hart (New York: Da Capo Press, 1953), 226; and B. A. Friedman, *On Tactics: A Theory of Victory in Battle* (Annapolis, MD: Naval Institute Press, 2017), 92. This oft-used quotation is intended to combat the "just get it done" mentality that often pervades packed training schedules and overworked staffs. "Taking care of the troops," as Rommel suggests, means doing training qualitatively better; tough, demanding training is personally rewarding for the individual and collectively appreciated by the unit. The fact that he served an evil regime takes nothing away from his sage advice as he earned the grudging respect of the Commonwealth forces he fought in the North African desert during World War II.

Wargaming Development Series
Developing Impactful Wargame Narratives through Storytelling

Stephen M. Gordon; Colonel Walt Yates (Ret), USMC; and Andrew Gordon

Abstract: Nothing connects people more powerfully than well-told stories. Humans have been telling each other stories since long before they could write them down. Sharing stories is a critical part of building trust with others, and that trust is essential to creating meaningful connections with people. Great stories have structure and purpose; they appeal to our deepest emotions and are most compelling when they challenge or change our perceptions of reality. There are rules to the methods and techniques that create great stories. This article explores the benefits and challenges of applying successful storytelling techniques to designing wargame narratives that balance creative ambitions with achievable timelines. Wargames that incorporate such techniques will surface new trends and better inform future conflict planning.

Keywords: wargaming, storytelling, brain-trust, creative, military, transformation

> Storytelling is a team sport that requires extraordinary people.
> Storytelling is like trying to climb a mountain with a whole

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party of people, with a lot of stuff to bring up the mountain—one person can't do it alone.

~ Steve Jobs[1]

Introduction

Great stories take people through a transformation, a journey that is memorable, personal, and impactful. All great military transformations have had stories to shape and explain them. The adoption of the railroad in the nineteenth century, of tanks and airplanes in the early twentieth century, of nuclear weapons in the 1950s, and of information and cyber capabilities more recently were all built on persuasive stories about how each could change warfare. Those stories in turn permeated the wargames and experiments that tested, validated, and refined the transformations. The common definition for wargaming is outlined in the 2013 *Joint Planning*, Joint Publication (JP) 5-0: "Wargames are representations of conflict or competition in a synthetic environment, in which people make decisions and respond to the consequences of those decisions."[2] Wargames help commanders examine warfighting concepts, train and educate military leadership and analysts, explore various conflict scenarios, and assess options for future force planning and posture choices. Wargame narratives, worlds, and characters using techniques adapted from successful storytelling will open up a range of new thoughts and ideas as these stories unfold.

Great stories can live on forever but technologies have limited life spans, periods after which they simply become parts of the sediment layer on which other new things are built. A well-told story can live for thousands of years, inspiring new thoughts, creative interpretations, and fresh perspectives—fuel for new stories to take shape. There is a long history of technology's presence in storytelling, fused in hybrid science fiction and fictional narratives, inspiring innovation and invention that travels from the written page or screen to real-world use. Arthur C. Clark's *2001: A Space Odyssey* and Phillip K. Dick's *The Minority Report* and *Do Androids Dream of Electric Sheep?* (retitled *Blade Runner*) have influenced future applications for artificial intelligence, video game design, voice-activated assistants, vehicle heads-up displays, virtual reality, gesture recognition, and computer vision.

Storytelling and Wargaming

The U.S. Army Training and Doctrine Command (TRADOC) Mad Scientist Science Fiction Writing Contest, launched in 2016, embraces storytelling techniques as a pathway to fuse science fiction writing with reality, contributing to ideas and expanding the Army's thinking about future challenges in conflict. For warfighters, these stories challenge conventional thinking and help

illustrate a grounded projection into the future by crowdsourcing new ideas that help the Army envision potential scenarios in a future operational environment. Through a range of storytelling examples, the narratives developed through the Mad Scientist writing contests and initiatives blur the line between fiction and science fiction to imagine a not-so-distant future world of conflict, the characters that inhabit these worlds, the technological advancements not previously considered, yet possible, and how things could potentially play out. These stories are set within worlds that explore future conflict in multidomain operations (MDO), including space, cyber, sea, land, electronic warfare, and emerging threats of all sizes and shapes—all of which are important topics for Army leadership.[3]

Whatever their form, wargames provide command, staff, defense, and national security experts with a synthetic environment to experiment with future conflict concepts. Whether for education, training, operational planning, force design, future force investments, or answering pure research problems, wargames engage participants to think through all the complexities of bringing their imagination into a useful reality. To make the creative process work by gaining insights from outside-the-box thinking, there needs to be a framework in place—a playbook that, when followed, can draw out important trends and reveal new insights. Training and preparing for an outdated adversary risks missing the "high concept," the main premise and focus of the exercise, the big idea. The *high concept* is a term borrowed from the film industry that describes a story with a unique and concise premise, usually told in three sentences or less. This is not exclusively a military or national security dilemma. A high concept story has three key elements: it is easily explained, it is intriguing, and it is event driven. The "big idea" is another phrase adapted from film and story development, representing the central point and big picture concept that the reader should walk away with. In a wargaming narrative, for instance, the big ideas are the lessons, core concepts, principles, themes, and theories that the wargame will explore.

Innovation Is Essential

Corporations face similar challenges competing in a modern economy. A corporation's ability to digitally transform its organization, out-innovate its competition, and constantly accelerate its decision making are major determiners of success. The greatest responsibility of the chief executive officer (CEO) of a large organization is to recognize when a major change in direction becomes necessary. No bold new course of action can happen without the CEO giving the green light, yet their power and privilege leaves them insulated—perhaps more than anyone else in the organization—from information and ideas that might challenge their assumptions and allow them to perceive a looming threat

or opportunity. Deliberately seeking out environments where they are more likely to encounter new ideas, for instance spending time understanding problems faced in other industries or countries, opens up a range of potential new concepts for consideration. Watching the way an animated feature at Pixar is created, for instance—from the original idea through the ups and downs of crafting a story, types of tools and technologies used, how to improve the story, resolve conflict, create memorable characters—many of these processes have incredible value transferable to any industry. Stephen M. Gordon believes that, while leaders may not formulate brilliant ideas on command, they can increase the chances that flashes of insight that will occur by understanding the conditions that give rise to transformation by pursuing those concepts further. As Amazon CEO Jeff Bezos said, "One of the only ways to get out of a tight box is to invent your way out."[4]

The Marine Corps has recognized that transforming the way it fights requires transforming the way it wargames. Its commitment to transformation means ensuring modern wargames provide greater analytical support, better prepare for future force design scenarios, and enhance ongoing training and learning through immersive experiences. General David H. Berger, 38th Commandant of the Marine Corps, highlighted in the *2019 Commandant's Planning Guidance* the need for enhanced wargaming as "essential to charting our course in an era of strategic fluidity and rapid change."[5] But a wargame is only as good as its scenario, and a scenario is a story. That story sets the context and the challenge and shapes the flow of events throughout the wargame. It powerfully shapes the lessons the game yields. Improved wargames will produce new ways of problem solving by creating stories that are progressively complex, thereby accelerating the transformation of the Marine Corps vision and ideally setting new standards across the rest of the American national security establishment.

Like an effective wargame premise, a well-told story and hook must inspire participants to engage and think. The story engine powers the narrative, setting up an emotional hook that grabs the audience's attention. The hook introduces something shocking or unexpected into the story and typically has distinct sets of stakes: internal, external, and philosophical.

Development of Wargaming Stories

A survey of literature on the conduct of wargames provides support for an increased emphasis on the development of a story. The *Art of Wargaming* by Peter Perla is a foundational book on the subject that identifies seven elements of a wargame, one of which is the scenario.[6] The scenario encompasses the story narrative leading up to the commencement of the wargame and explains how the friendly and enemy forces are arrayed. *The Art of Wargaming* says the following about the role that a well-developed scenario plays in a wargame:

> The scenario sets the stage for the game by placing players in specific situations and giving them a context for their decision making. The scenario can have a significant, if not overwhelming, effect on the decisions players are able to make.[7]

The *Craft of Wargaming* by Jeff Appleget, Robert Burkes, and Fred Cameron published in 2020 also emphasizes the importance of the scenario and terms it as "the most critical element of the measurement space."[8] Appleget breaks the wargame creation process into five distinct phases: initiate, design, develop, conduct, and analyze. He also uses examples to demonstrate how the analytical wargaming framework can be used to create relevant and useful wargames. The authors caution that "a scenario that is not compelling to the players almost always dooms the wargame to failure."[9]

One of the most widely discussed wargames in the public sphere was Millennium Challenge 2002, a wargame conducted by United States Joint Forces Command (USJFCOM), because of its unusually public and contentious outcome.[10] Millennium Challenge was to serve as a validation exercise for Operation Iraqi Freedom that was executed a year later. Millennium Challenge became famous, or infamous, because of the public statements by the Red Force commander, retired Lieutenant General Paul K. Van Riper, which were critical of the USJFCOM after the wargame. The events of Millennium Challenge from Van Riper's perspective are covered in a chapter of Malcolm Gladwell's best-selling book, *Blink*.[11]

Just as the wargame was getting started, Van Riper launched preemptory attack on the assembling invasion force in the Persian Gulf that achieved both surprise and catastrophic damage to the fleet according to the simulations used to adjudicate the weapons effects for the wargame. His account of the decision-making process in playing the role of Saddam Hussein shows clearly that he achieved surprise at the operational level because he had a deeper appreciation for Saddam Hussein's situation and potential risk than did his adversaries on the U.S. Central Command (CENTCOM) staff. By studying recent history, personality profiles of Saddam Hussein, and the intentions of his adversaries as revealed by their actions, Van Riper had a far better appreciation of the risks and consequences facing Saddam Hussein than did his opponents. He constructed the compelling narrative himself and used it to guide his strategy. The CENTCOM staff was shocked because their narrative, or the absence of a narrative, blinded them to the possibility of a massive preemptory attack against them.

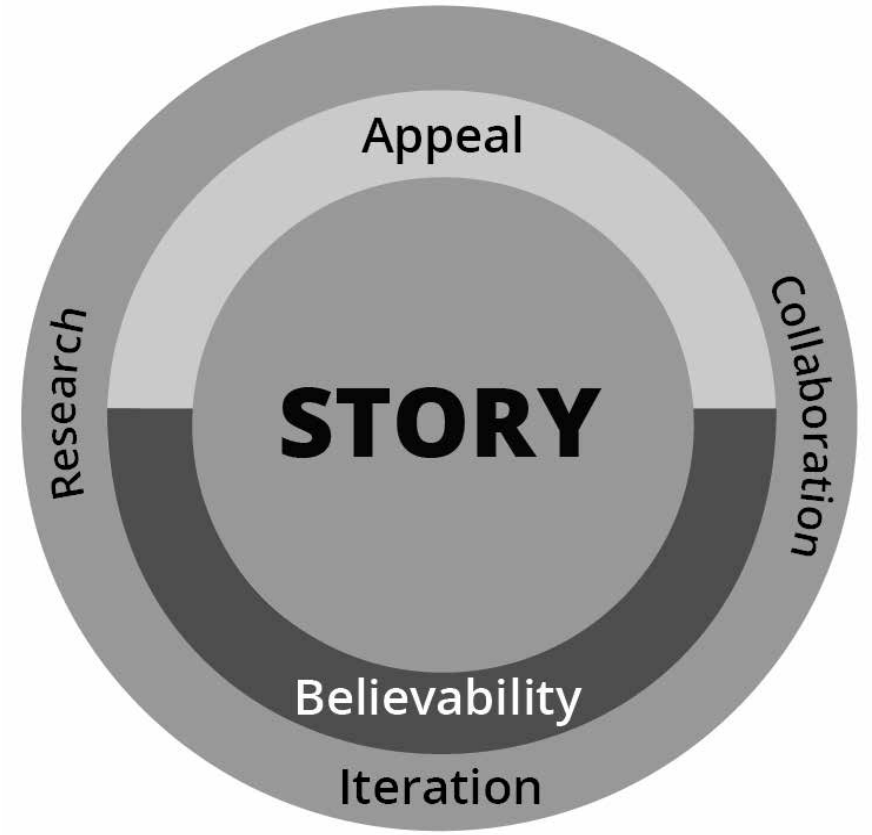
Wargames attempt to solve complex problems by encouraging participants to strive for originality and collaborate and communicate outside their organizational chain of command without fear of failure or apprehension to offer breakthrough concepts. Giving candid feedback, not confusing the process

with the goal, and preparing for the unknown are a few of the seven core creative principles that built the foundation of a creative culture at Pixar, which has produced consistent results, more than 30 academy awards, industry standard software innovation, creative design and cinematic achievement, and a standard by which the art of storytelling is measured.[12] Each of the seven core principles have value in creating, designing, delivering, and analyzing the outcome(s) of a wargame as it strives for originality, fosters problem solving, and pushes wargaming participants to reach new heights. By studying each of these principles, the defense community can better prepare to design concepts with a blueprint that is designed to produce new insights, examines unknown and new pacing threats, and encourages a creative process throughout the entire wargaming process.

As future digital wargames become distributed, adding complexity, this will require out of the box thinking to adapt to a range of scenarios and unknown conditions. A paradigm shift for wargaming is needed to pivot to a more creative process driven by fundamental core principles. Examining the seven core principles in more detail, starting with "quality is the best business plan"—a mindset you must have before you decide what you are setting out to do. For a wargame activity this means do not settle for obvious and easy answers—push yourself to uncomfortable places and do not be afraid to reach for new ideas that may seem outside the lines, but keep iterating, "Failure isn't always a necessary evil"—the cost of preventing errors is often far greater than the cost of fixing them. Uncouple fear and failure; do not be afraid to make mistakes. In a wargame among peers and officers with a range of experience, it can be intimidating to offer new concepts for consideration, especially if there is pressure to keep moving the game narrative forward for the sake of time. This is the time and place to make mistakes: expand thinking and open up the conversation to input and critique. "People are more important than ideas": if you give a good idea to a mediocre team, they will screw it up. But give a mediocre idea to a great team, they will either fix it or come up with something better. That is why people matter.

As artificial intelligence (AI) continues to develop and aid in decision making, we still rely upon people for insights, experience, reasoning, and creative thinking that defies convention. Wargames should generate ideas that have practical and strategic value in a decision-making process, similar to the way an animated feature takes the audience on a journey; it opens your mind to think about what might unfold next. Prepare for the unknown—probably the most glaringly obvious of the core creative principles with application for wargaming. Unforeseen, random events happen. And when they do, this principle advises not to waste time playing the blame game. This guidance is as true in the design phase of a wargame as it is during game play, adjudication, and analysis. Being

Figure 1. Pixar's three main design principles—story, appeal, and believability



Source: courtesy of author, adapted by MCUP.

able to respond to unknown outcomes, adapt, overcome, and figure out ways of solving problems through creative processes will produce more valuable wargaming insights—during play and in any post-game analysis. Communication structures should never mirror organizational structure. A chain of command is essential but making sure that everything happens in the "right" order and through the "proper" channels may limit the valuable insights that a wargame could provide if this restriction were relaxed. This is more of a cultural organizational challenge than a process challenge. Finally, give good notes. Giving feedback adds value to the creative process and should include what is missing, what is not clear, what does not make sense. This is not an attack on an individual or group; rather, it challenges the thinking to become more refined, resulting in sharper concepts. Understanding the process that has made Disney/Pixar successful can also directly assist the Marine Corps in thinking about transformation. The Commandant's transformation vision for tighter integration of people, process, technology, and culture mirrors how Steve Jobs designed Pixar

to be a place of incredible creativity and technological innovation as well as an idea factory for new concepts that attracted and retained talent.[13]

The following pages examine more closely some of the characteristics that made Pixar one of the most successful story studios in the world and explore how the magic, art, and science of storytelling can be applied to wargame design and thinking about military transformation.

Pixar's Storytelling Philosophy

Pixar's story design philosophy emphasizes the story concept as the center of the design model.[14] During an informal lunch conversation with colleagues in 1994 at NeXT Computer, Inc, a company cofounded by Steve Jobs, Steve commented that "the most powerful person in the world is the storyteller. The storyteller sets the vision, values, and agenda of an entire generation that is to come."[15] That insight was profound and important at a studio producing *animated* movies, which are shaped so fundamentally by the effects that technologists can produce. Jobs was reminding Pixar's employees that the technological effects are secondary—the story is primary. The generalized lesson that humans matter most and machines are never the center remains important to the Marine Corps and to the military as it thinks about a technology-based transformation today.

Transformation also requires an openness to ideas and criticism that can be just as hard to sustain in a successful company as it is in the hierarchy of a military organization. Ed Catmull, cofounder of Pixar, made it a practice to give an address to new employees in which he would declare openly that he did not have all the answers. In a 2008 *Harvard Business Review* article, Catmull explained:

> I talk about the mistakes we've made and the lessons we've learned. My intent is to persuade them that we haven't gotten it all figured out and that we want everyone to question why we're doing something that doesn't seem to make sense to them. We do not want people to assume that because we are successful, everything we do is right.[16]

The physical environment in which imagination, storytelling, and the development of concrete outcomes occur is also important. In the early days of Pixar, the main campus was located inside a corporate park in Point Richmond, California, a small industrial town surrounded by giant Chevron oil refinery storage tanks, stacks, and large gas trucks winding their way around the narrow streets. As Andrew Gordon observed working at Pixar's Point Richmond office, the industrial setting inspired Pixar's story designers to work the environmental settings into a couple of Pixar's films and stories like *Cars* and *WALL-E*. Pixar's current location in Emeryville, California, is a modern, gated campus, yet it

retains an industrial loft design featuring large steel beams with hand-pounded rivets (Steve Jobs insisted on this detail) reminiscent of the industrial warehouse look of the area from the 1920s. Jobs designed the building's interior to be an extension of the creative process with an open and bright space, wide hallways with almost a garage-like feel, which employees refer to as "the atrium" with snack and coffee areas for conversations, and an amazing screening room where guest lectures and screenings are hosted. The main building is organized like parts of Manhattan, with sections called the Upper West Side and the Lower East Side. An annex building for overflow staff two blocks away, meanwhile, was appropriately named "Jersey," a subtle jab at how New Yorker's refer to New Jersey.[17]

The creative process happens anywhere and everywhere, enabling natural interactions and mingling among employees is an intentional part of the magic behind Pixar's story process. For more structured meetings, screening rooms in the building provide a connected, collaborative environment to review work in progress. These interactions facilitate feedback, help iterate the story development process, reimagine storyboards, and bring a tactile element to the creative process. For example, a designer may bring a swatch of fabric or a clay model for a tactile study of a character or story element before moving the process into digital form.

In a productive story design meeting, anyone can be completely candid, share their feedback on any topic, and give notes aimed at achieving a more impactful story. Pixar cofounder and President Ed Catmull argues that early versions of Pixar movies are usually bad; in Catmull's words, "early on, all of our movies suck."[18] Early versions of ideas and stories can be so discouraging that there is pressure to cut your losses if an idea is not proving itself quickly. At Pixar, Catmull offers some counterintuitive advice, to "protect your 'ugly babies'—your unsightly ideas. Think of how a movie starts out. It's a baby. It's like the fetus of a movie star; we all start out ugly. Every one of Pixar's stories starts out that way. A new thing is hard to define; it's not attractive, and it requires protection." Catmull adds,

> When I was a researcher at [Defense Advanced Research Projects Agency] DARPA, I had protection for what was ill-defined. Every new idea in any field needs protection. Pixar is set up to protect our director's ugly baby. Of course, you can't protect the baby forever. At some point, it has to grow up and change into something, because the beast is still there. That's a positive thing. Because sometimes the ugly baby would rather play in the sandbox forever.[19]

Collaboration, iteration, and continued refining of stories until they feel

right is a key part of the blueprint that has produced Pixar's repeated success. Iteration plays a big role in story development. From initial idea to finished product, an animated feature can take four years or more to produce. Pixar's success—more than 30 Academy Awards, Golden Globe Awards, Grammy Awards, and numerous nominations and industry recognition for sound editing, animation, short films, and others—are rooted in their dedication to great storytelling. This approach offers great value to the craft of wargame design.[20]

Wargames Can Reveal Unanticipated Risks

Wargames aim in part to reveal unanticipated risks. Former U.S. Secretary of Defense Donald H. Rumsfeld noted in 2002: "There are known *knowns*; the things we know we know. We also know there are *known unknowns*; that is to say we know there are things we do not know. But there are also *unknown unknowns*—the ones we don't know we don't know. It is the latter category that tend to be the difficult ones."[21] Wargames can help identify "unknown unknowns" if the stories on which they are based propel wargamers to explore new ideas.

Threats to warfighters that seem to come out of nowhere can be the most difficult to simulate. The worst disruptions happen when warfighters are blindsided by innovations and new threats that they never even imagined were possible. Identifying such unknown unknowns requires an expanded imagination outside of one's comfort zone. Joseph Campbell famously wrote, "where you stumble, there lies your treasure. The very cave you are afraid to enter turns out to be the source of what you are looking for. The damned thing in the cave that was so dreaded has become the center."[22] Both wargaming and storytelling must proceed from this basis.

Pixar's approach to telling stories in its movies is focused on engaging the audience. A scene in the movie *Up* captures this principle well.[23] The writing, acting, and gestures of a character struggling to build a tent convey the idea that his home life is poor, drawing empathy from the audience. Simply telling the audience flat-out that things are not so good at home would have elicited little or no emotion. Storytellers should want their audiences to pick up on nuances rather than handing them everything. This type of storytelling is the opposite of exposition, which simply feeds the audience exactly where the story is headed. It is much better to show and not tell in order to engage.

Pixar Director Andrew Stanton coined the concept "the unifying theory of 2 + 2." Storytellers should not simply tell the audience that the answer is four, but rather should give them two and two and let them work it out for themselves. Great storytelling is akin to solving a puzzle. With every step in the story progression, the audience should be trying to solve the puzzle before the

next scene occurs, anticipating where it is headed, and how the journey is going to unfold. The task of commanders and staffs in combat—or wargames—is similar.

As described earlier in this article, during the construction of a wargame, the problem-scoping phase details the problem as it is explained by the sponsor. The scoping exercise clarifies and confirms the wargame's intention and objectives. This important phase is where the central story is established, worlds are created, and characters who live in these worlds are populated. These elements set up the order of battle, articulate the known friendly forces and the adversary, set the underlying tensions, and establish an inciting incident that provokes the launch of the game. The result is a synthetic design with characters, plot, conflict, high points, and low points—the core elements of a story. This is commonly referred to in the wargaming community as "The Road to War" brief.[24] Walt Yates argues that, in most wargames, the Road to War brief does not receive adequate effort and emphasis.

The Narrative Development Process

The narrative development process for a wargame is very similar to the story design of an animated film at Pixar; it begins with a logline or controlling idea. The logline is a roughly 25-word statement that includes four major elements: the main character, the conflict, the way the character changes by overcoming something, and a hint of the character's world. Once the creators have the skeleton of a story and some art, the project transitions to "the pipeline," where technical experts figure out how to create the story on a computer. Every story project presents new technical challenges, which lead to new ideas, referred to as *plussing*, the process of iterating and building on ideas to make good ideas great.

Most good films go through at least one giant crisis—a moment where the film blows up. Rewrites are an essential part of trusting the process, and creators must have faith that changes to their work represent progress, not setbacks. During Andrew Gordon's 20 years at Pixar, the studio's overriding goal was to craft "diamonds." The whole company consisted of people who wanted to do the best work possible and make films they loved. The thought was: if the studio made films the creators liked, then audiences might like them as well. Pixar's president, Ed Catmull, defined the two guiding principles he thought would guide the company to success: "story is king" and "trust the process."[25] While these mottoes were inspirational, Catmull soon discovered they fell apart when put to the test. Catmull thought *Toy Story 2* would be an easy win for the studio if the creative team just remembered these guiding principles. Proving too rigid for a creative studio, while "trust the process" is still etched into the brick facade

of the Steve Jobs building at Pixar's Emeryville, California, campus, these two guiding principles have evolved into the seven core creative principles ever since *Toy Story 2* in 1999.

To provide a mechanism for feedback and problem-solving during the story process, Pixar created the "Brain Trust." The Brain Trust, later brought to Disney and called the "story trust," is a small group of people with a deep understanding of storytelling, convening to give candid notes to the director on the latest screening of a movie. Editors, heads of story, directors, screenwriters, color experts, sound engineers, and all other manner of talent are involved in Brain Trust meetings.

For the Brain Trust to function properly, four principles must be met:

- First, nobody can override the director. In a Brain Trust session, the director takes feedback but does not have to accept the notes provided in the meeting. These notes are suggestions that are openly discussed, but at the end of the day it is up to that director to understand the "spirit of the note."
- Second, the power structure must be removed from the room. Steve Jobs was not in Brain Trust meetings because, as one animator put it, "Steve's presence would take all the oxygen out of the room." The idea was to build a safe space where people could give and receive notes on the work without fear of saying something embarrassing and looking bad, offending someone, or being intimidated.
- Third, everyone must have a vested interest in one another's success.
- Fourth, everyone must give and receive honest notes. Brain Trust meetings have no authority to make changes but instead seek to get a director to address problems they cannot see.

A particular problematic component of a story may not become apparent until the very end of the project, perhaps when the film is a mere five months from release and an audience screening yields less-than-stellar results. An audience member might say, "I don't understand the main character." In the case of the film *Inside Out*, test audiences perceived the character Joy, a main character who personified her eponymous emotion, as being "snarky" in her interactions with the other inner thought voices (sadness, fear, disgust, and anger).[26] A few tweaks to the writing and delivery of Joy's lines improved the entire story; subsequent audiences connected to and rooted for her.

Places like Pixar work because they embrace collective knowledge and the understanding that they are always course correcting, always questioning. Once

a creator stops questioning or self-reflecting, their work is in trouble. Creators must maintain a student-like quality of always questioning and learning.

Character definition matters for military transformation and wargaming because it engages and harnesses the imagination and the intellectual and emotional engagement of the audience.

Human Behavioral Characteristics in Wargames

Human behavior has significant effects at the military unit and organizational level, according to Ben Connable and a team of Rand researchers studying behavioral factors influencing the will to fight.[27] In 1996, Microsoft published *Close Combat,* a video game that used a psychological morale model for each individual combatant, with behavioral characteristics including mental condition, stamina, and panic. These were the themes presented during Digital Transformation of Wargames, a digital event held by the Georgetown University Wargaming Society in partnership with the Institute for the Study of War.[28]

Dr. Barry Silverman's *NonKin Village,* developed at the University of Pennsylvania's School of Engineering and Applied Science, simulates cognitive conditions that do not deal with seizing and owning geographic space, or employment of weapons, or achieving objectives through armed conflict.[29] The name *NonKin* is derived from the concept of nonkinetic interactions between operating forces and the populace in an area of operations. The software simulates interactions across a socially dynamic environment to model battles over "the human terrain." The Human Terrain System was an experimental effort to embed academic and social scientists with Army and Marine Corps units to dramatically increase local sociocultural knowledge of the battlefield.[30] An objective in this simulation may be simply peaceful commerce or supporting a prosperous economy under the rule of law. The AI characters in this simulation care about social interactions such as observance of socials customs and gestures. For example, an AI character will react to a player raising a weapon toward them. These AI characters also have connections between one another, forming a social fabric that mirrors those seen in real communities. Changes to this social fabric can lead to other changes to the simulation environment. For example, a local tribal leader skimming money may cause the local population to become poorer, eventually to the point that members of the population fall victim to recruitment by a local jihadi network and take money to kill Americans.

These realistic human conditions provide great insights by pioneering authentic simulated human behavior—a core ingredient in powerful storytelling that is portable to wargames. It is even easier in the realm of military futurology than in Pixar's studios to become fascinated by technology and lose sight of the centrality of human conception and comprehension. Getting the technology right is not the hard part. The hard part is getting the ideas right. The details

of the Pixar process offer useful starting points for the process of generating wargaming scenarios, but the core lesson is more important than those starting points. In the realm of military transformation, getting the ideas right means getting the imagination right—that is where the storytelling approach helps most.

The technologies already exist to transform military wargaming. Digital technologies will continue to revolutionize wargames that push problem-solving beyond two-dimensional tabletop exercises. Automating manual tasks using artificial intelligence and machine learning algorithms makes it possible to sift through and analyze terabytes of documents, pictures, audio, and sensor array data to create correlations in seconds that would otherwise take weeks or months. Voice assistants will execute complex instructions using the current methods of communication between command staff and subordinate units. Technology supporting the wargame can and should be as transparent and naturally integrated as possible, not distracting participants from the core objectives of the exercise. These assistants can provide real-time, data-driven confidence scores showing the likelihood of success or failure for a planned maneuver or strategy and make suggestions or alternatives for consideration.

Software, hardware, and other devices originally developed for consumer gaming are already accelerating the digital transformation in military applications and simulations. The USS *Colorado* (SSN 788), the U.S. Navy's latest *Virginia*-class attack submarine, went into service in 2018 from the Naval Submarine Base New London in Connecticut. It comes with an unconventional piece of equipment: an Xbox controller, to raise, turn, and lower the submarine's photonic mast, according to *USA Today*.[31] The U.S. Army Synthetic Training Environment, together with the University of Southern California Institute for Creative Technologies, has developed One World Terrain (OWT).[32] OWT is an authoritative, geospecific representation of the planet for next-generation modeling and simulation that uses some of the same technology and interactive user experiences found in commercial simulation experiences like Microsoft's *Flight Simulator*.[33] The Army's Program Executive Office Soldier has developed an Integrated Visual Augmentation System that integrates next-generation 24/7 situational awareness tools, cloud services, and high-resolution simulations to deliver a single platform that improves soldier sensing, decision making, target acquisition, and target engagement based on Microsoft's commercially available ruggedized, augmented-reality lens.[34]

IBM, Red Hat, and the Overwatch League (an international e-sports league) developed a cloud-based platform where AI algorithms objectively rank teams and players across the league—providing performance statistics, handling more than 20 teams competing simultaneously from all over the world. In a wargaming context, these types of technologies are valuable in reinforcing learning

and competency concepts, distributed wargames that span time zones and an AI that provides dynamic confidence scores from decisions, maneuvers, and wargame tactics, potentially reducing the time for a wargame analysis after action report to a near real-time data stream.[35] These and many other commercial gaming tech design tools and solutions offer portability, rich visualizations, and sophisticated physics engines and can be readily repurposed for analytical wargame scenarios. Integrating commercial game titles into education and training scenarios adds value to classroom training, reinforcing learning concepts and encouraging collaboration through immersive gameplay of modern and historical battles. With modern software, a range of endpoints, from touch screens to augmented and virtual reality lenses integrated with business processes and a trusted story framework, wargame developers can develop past, present, and future worlds. There is boundless artistic freedom.

The data to feed these technologies is also more readily available than ever because the world is deep into the era of overwhelming data. Digitally enabled wargames can harness this data using AI to speed through content and find patterns, anomalies, and insights useful for human decision making. New wargames in digital form can be generated rapidly and streamed to participants with the ease of signing into a Netflix or Disney+ account. Data is the fuel that powers a digitally enabled wargame and as wargames grow in complexity into areas where there is limited data, the need for continued innovation in areas like edge computing, 5G (fifth generation broadband) unmanned sensors, video processing, immersive visualization tools, etc. will be important for representing conflict domains accurately. Edge computing and 5G are terms developed from the technology and telecommunication sectors that define new capabilities to push computing and connectivity beyond the datacenters, out to the tactical edge where decision making requires low-latency, intense graphics processing. For instance, operation in the high Arctic and the deep ocean present unique challenges to current simulation tools and models as there are limited data sets available. Synthetic representations of terrain and environments, augmented with actual telemetry from a range of sensors, both open source and sensitive, provide the data needed to run realistic wargames that attempt to replicate real-world conditions. The ocean, despite covering more than two-thirds of Earth's surface, remains largely unexplored. The deep ocean extends from 1,000 to 6,000 meters (20,000 feet) and constitutes most of the ocean's volume as well as the largest living space on Earth. For context, 12 people have spent a total of 300 hours exploring the surface of the moon, whereas only 3 people have spent less than 3 hours exploring the deepest spot in the ocean.[36]

As commerce, transport, food, economies, and conflict increase interaction with the ocean, more detailed models of the ocean from its surface to its lowest depths are needed to simulate conditions based on real, reliable data. New

unmanned sensors built from lightweight materials and longer battery life will soon reach every layer of the water column and collect and stream live terrain data, atmospheric conditions, and other details fed into a live wargame, freeing ocean modelers from the data constraints of legacy ocean sensing platforms, allowing wargame designers new data modules that can be added instantly or applied to a previously recorded wargame for new insights, where a decision maker may want to replay only the highlights of significant interest. Building story narratives that use scientifically accurate representations of the warfighting domains reduces risks and has value beyond the wargame.

Conclusion

Simply applying new tools and technologies to current wargaming procedures, without also adopting a storytelling mindset and approach that made those technologies effective in a commercial space, will not lead to improved value of wargaming products. Without participants investing in and understanding the structure of the story, its characters, and motivations, the outcome of a wargame likely will not yield desired results. Software and technological advances may generate an evolution in capability but not a revolution in the utility of future wargames; therein lies a great danger to American national security.

The United States can ensure that its armed forces are ready to defeat any adversary if U.S. leaders can imagine how that adversary might attack, defend, or otherwise seek to advance its interests at the expense of American security. But how can U.S. leaders and organizations avoid being surprised? How can they and their experts imagine ways in which America's potential adversaries might approach war now and in the future? How will military thinkers keep their imagination grounded enough in reality that they do not pour their research and development dollars into defending against fictional threats while still letting their minds roam freely enough to escape the trap of seeing only what they expect to see? Those are the challenges that all good storytellers must overcome. The storytelling process is the essential missing component to transforming the U.S. approach to wargaming and warfare. Drawing conclusions from the output and data collected during wargames is best achieved by improving story design.

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Opportunity Lost

Major Ian T. Brown, USMC

The Blind Strategist: John Boyd and the American Art of War. By Stephen Robinson. Dunedin, NZ: Exisle Publishing, 2021. Pp. 360. $35.99 (hardcover).

Air Force Colonel John R. Boyd was a polarizing figure in his lifetime. His legacy includes practical and theoretical contributions to American national security that remain influential today, such as the Energy-Maneuverability Theory, development of the McDonnell Douglas F-15 Eagle and General Dynamics F-16 Fighting Falcon fighter aircraft, and a deep influence on the U.S. Marine Corps' maneuver warfare doctrine. Yet, woven among these accomplishments was another legacy, dominated by an almost puritanical personality that drew to him a tight group of zealous friends; alienated senior military and civilian leaders; and kept his family in borderline poverty so that his reputation for independence be untainted by allegations of material self-interest. Much of that legacy was turned into legend by Robert Coram's hagiography *Boyd: The Fighter Pilot Who Changed the Art of War* (2002). However, in the years following, a number of works sought to move past the legend and reexamine Boyd's original concepts—not the often sensationalist interpretations of those concepts promulgated by both critics and proponents—to determine whether the man's reputation as "the most influential military thinker since Sun Tzu" was deserved.[1]

The Blind Strategist: John Boyd and the American Art of War, by Austra-

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lian author Stephen Robinson, aims to add its own decidedly negative answer to that reputational question. Robinson's previous two books—*False Flags: Disguised German Raiders of World War II*, and *Panzer Commander Hermann Balck: Germany's Master Tactician*—focus on specific tactical-level operations and leaders.[2] Here, he turns to a much broader subject, seeking to assess not only the intellectual development of Boyd's conflict theories but their impact, both conceptually and in execution, across decades of American military operations. This reviewer, having conducted research and writing on this subject, viewed its publication with excitement after learning of its pending release last summer. Yet, on reading the galley proofs, excitement turned to sufficient disappointment that this reviewer declined a requested endorsement, and that disappointment remains with the final published work. There exists a great deal of raw, unassessed archival material on Boyd that could be fed into the growing pool of scholarship on the former fighter pilot's ideas on conflict—with their attendant influence, strengths, and weaknesses. Unfortunately, Robinson's product is an opportunity missed, which—with its own internal confusion, selective evidentiary standard, and recycling of old Boyd myths that newer scholarship has already disproven—stands as its own obstacle to gleaning deeper lessons.

Analyzing Boyd's thought is not easy; the challenge in determining his impact on American military thought, or what Boyd did or did not truly think, lies in the fact that his body of work is ensconced in the Marine Corps History Division's Historical Resources Branch (hereafter HD Archives) in formats not easily digestible. Outside of the dense and entirely abstract essay "Destruction and Creation," Boyd rarely conveyed his ideas in written prose. His mode of communication was the multi-hour briefing, anchored on acetate slides and executed via lecture and Socratic inquiry. Researchers can easily access the slides, which are digitized on the internet beyond the walls of the History Division; yet, Boyd's much more detailed speaker notes were all in his head. Had Boyd lived in the age of YouTube and TED Talks, this might not be a problem, as those wanting to hear Boyd in his own words could, at their leisure, play back high-resolution videos with crisp audio and artificial intelligence-generated captions and transcripts. But Boyd was a YouTube personality in a VHS age. The HD Archives holds a number of audio and visual recordings of Boyd delivering his various briefings, but their quality combines the limits of late twentieth-century cassette recording technology with the vagaries of time on such media.

As mentioned above, despite these challenges, several recent researchers have sought to bring Boyd's original thinking to light piece by painstaking piece, both to more objectively assess his impact at the time and analyze what themes remain relevant, even prescient. Daniel Ford's *A Vision So Noble* reevaluated Boyd's commentary on insurgency in the context of the Global War on Terrorism; *Airpower Reborn*, edited by John Andreas Olsen, looked at Boyd's

strategic concepts as they related to airpower theory and strategy; and Frans P. B. Osinga's *Science, Strategy and War* provided arguably the most detailed intellectual assessment of Boyd's various briefings to date.[3] This reviewer's *A New Conception of War* focused on Boyd's influence on the Marine Corps' maneuver warfare debate following Vietnam.[4] Each work moved the arguments about Boyd's thinking a little further from sensationalism and a little closer to true scholarship. The central issue with *The Blind Strategist* is its questionable selectivity in what it chooses to present from these works—when it does not ignore the scholarship or archival material altogether.

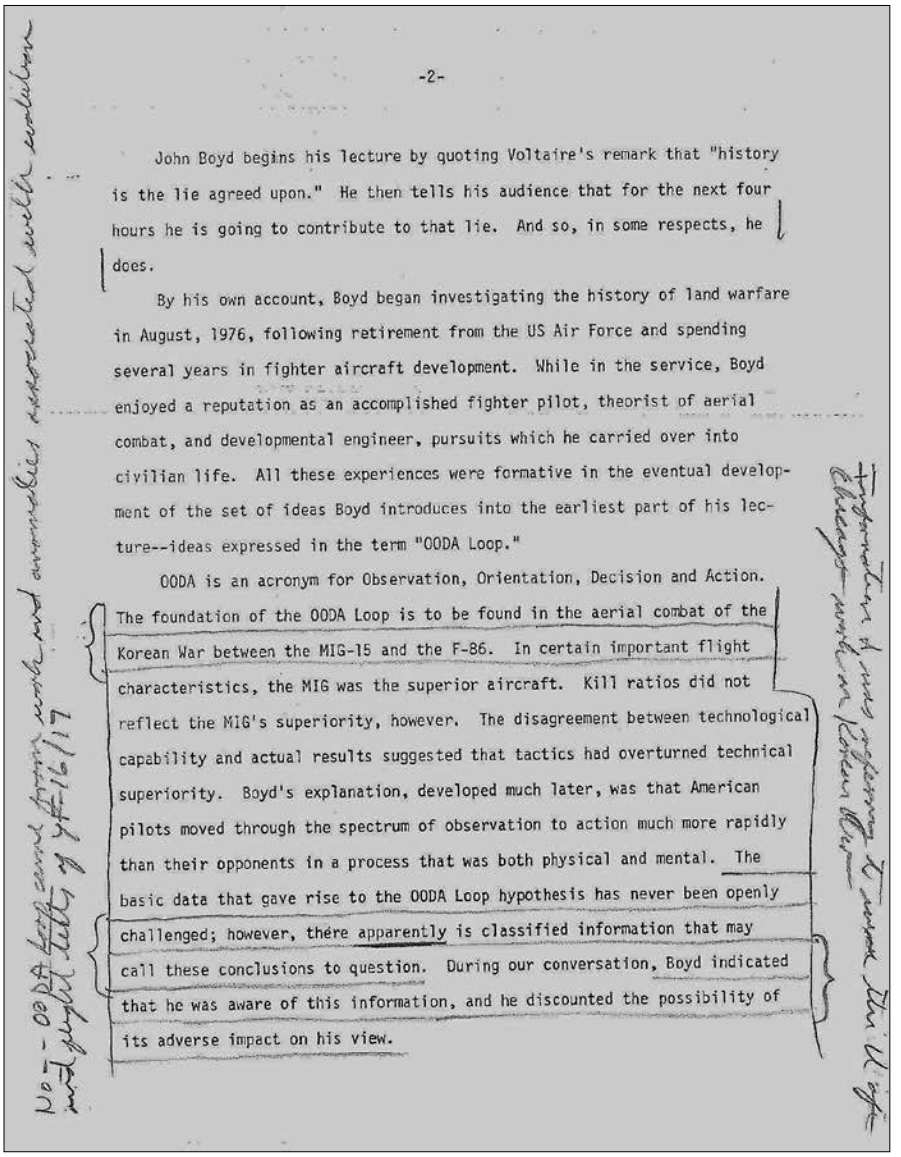
Robinson opens by claiming that Boyd's ideas are not merely flawed but literally rest on lies. As he states in the introduction:

> [Boyd] trusted historical accounts of World War II which professional historians later exposed as dishonest fabrications and, as a result, maneuver warfare rests upon a foundation of deceit. Boyd at first innocently injected misinformation into his theory, unaware of the dishonesty of others, but after major anomalies eventually appeared, he failed to re-evaluate his grand narrative. He ignored and misrepresented damning evidence in complete contrast to his own intellectual standards.[5]

A slate of German generals who commanded the *Wehrmacht* in World War II, and British military officer and theorist Basil Liddell Hart, form the two pillars on which Boyd's alleged deceptions rest. This argument is a significant departure from the historiography on Boyd, even among those assessments most critical of Boyd's ideas. While no theorist is beyond critique, such an indictment—damning not only Boyd's method but motive—would require a substantial body of new evidence in its favor. Yet, in condemning Boyd for ignoring and misusing history, Robinson succumbs to the same malady throughout *The Blind Strategist*—the book ignores or selectively uses much of the recent Boyd historiography and makes no use whatsoever of the archival holdings in the Marine Corps History Division. A close look at these primary sources and the broader historiography reveals a wealth of contradictory evidence that severely undercut Robinson's most critical assessments.

The Blind Strategist falls roughly into three sections, with the first two chapters examining Boyd's career and the genesis and development of his ideas. Chapters 3 through 6 lay out the "myths" and proponents thereof, which Robinson argues weakens Boyd's theories; and chapters 8 through 11 outline different areas of American military thought wherein Boyd's allegedly malign concepts wrought their negative influence. The book's trend of ignoring modern Boyd historiography manifests itself early on in the introduction and chapter 1. Here, Robinson describes the famous observation-orientation-decision-action

Figure 1. Boyd's handwritten note states: "No—OODA loop came from work and anomalies associated with evolution and flight tests of YF-16/17"



-2-

John Boyd begins his lecture by quoting Voltaire's remark that "history is the lie agreed upon." He then tells his audience that for the next four hours he is going to contribute to that lie. And so, in some respects, he does.

By his own account, Boyd began investigating the history of land warfare in August, 1976, following retirement from the US Air Force and spending several years in fighter aircraft development. While in the service, Boyd enjoyed a reputation as an accomplished fighter pilot, theorist of aerial combat, and developmental engineer, pursuits which he carried over into civilian life. All these experiences were formative in the eventual development of the set of ideas Boyd introduces into the earliest part of his lecture--ideas expressed in the term "OODA Loop."

OODA is an acronym for Observation, Orientation, Decision and Action. The foundation of the OODA Loop is to be found in the aerial combat of the Korean War between the MIG-15 and the F-86. In certain important flight characteristics, the MIG was the superior aircraft. Kill ratios did not reflect the MIG's superiority, however. The disagreement between technological capability and actual results suggested that tactics had overturned technical superiority. Boyd's explanation, developed much later, was that American pilots moved through the spectrum of observation to action much more rapidly than their opponents in a process that was both physical and mental. The basic data that gave rise to the OODA Loop hypothesis has never been openly challenged; however, there apparently is classified information that may call these conclusions to question. During our conversation, Boyd indicated that he was aware of this information, and he discounted the possibility of its adverse impact on his view.

Source: "OODA Loops [Handwritten Draft of the 'Essence of Winning and Losing']," folder 9, box 7, Col John R. Boyd Papers, HD Archives.

(OODA) loop's origin as derived from Boyd's air-to-air combat experience in the Korean War and as the precursor to the full body of Boyd's later work.[6] Both of these arguments are precisely backward: Boyd repeatedly corrected the OODA loop's origins in his own lifetime, and as the archival holdings show, in his own hand. Figure 1 shows one such rebuttal dating to the early 1980s that Boyd wrote in the margins of a critique by Roger Spiller, a professor at the Army's Combat Studies Institute.[7]

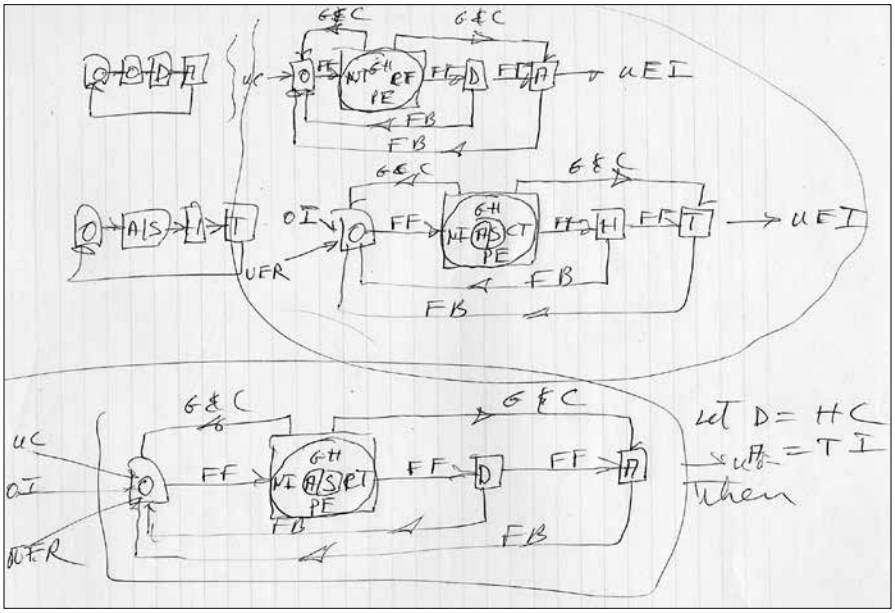
Boyd was emphatic that the OODA loop emerged as an output of the variations in human performance and perception he first observed during flight tests of F-16 and Northrop YF-17 prototype aircraft in the early 1970s. Many previous authors have recycled the Korean War "origin story" of the OODA loop, and *The Blind Strategist* continues this pattern, though the available documentation and historiography show otherwise.

As to Robinson's assertion that the OODA loop preceded the rest of Boyd's thought, the archival sources and historiography are clear that this is not the case. As Frans P. B. Osinga noted, Boyd did not draw out an actual graphical "loop" until 1995, only two years before his own death.[8] Disappointingly, Osinga's detailed discussion of the OODA loop is omitted in *The Blind Strategist.* Also omitted are Osinga's 100 pages spent laying out Boyd's intellectual evolution as Boyd pulled in information from disparate sources like the ancient Chinese military philosopher Sun Tzu, Thomas Kuhn's approach to scientific inquiry as "paradigm shifts," chaos theory, and nonlinearity and complex adaptive systems.[9] Osinga's *Science, Strategy and War* remains the single most detailed source on the genesis and evolution of Boyd's many strands of thought; but following a handful of citations in his introduction, Robinson ignores Osinga's work in the rest of *The Blind Strategist.* There is one exception: Robinson passingly cites Osinga to observe "Boyd never finished *Patterns of Conflict* as he always altered its content with improved insights."[10] This habit is indeed well-documented across the Boyd historiography; but while Robinson duly notes it here, he does not carry forward its implications in his later chapters, especially regarding the influence of German generals on Boyd's work. As will be discussed shortly, this failure undermines Robinson's core critique of the German impact.

Returning to the OODA loop—Boyd regularly mentioned it in his briefings but usually in passing as part of more detailed ideas he was exploring with his audience. It was only in 1995 that he depicted it; and the illustrations in his own hand show it was not the beginning of his ideas but rather the culmination of his decades spent thinking and rethinking them. Two drawings from the archives make this clear (figures 2 and 3).[11]

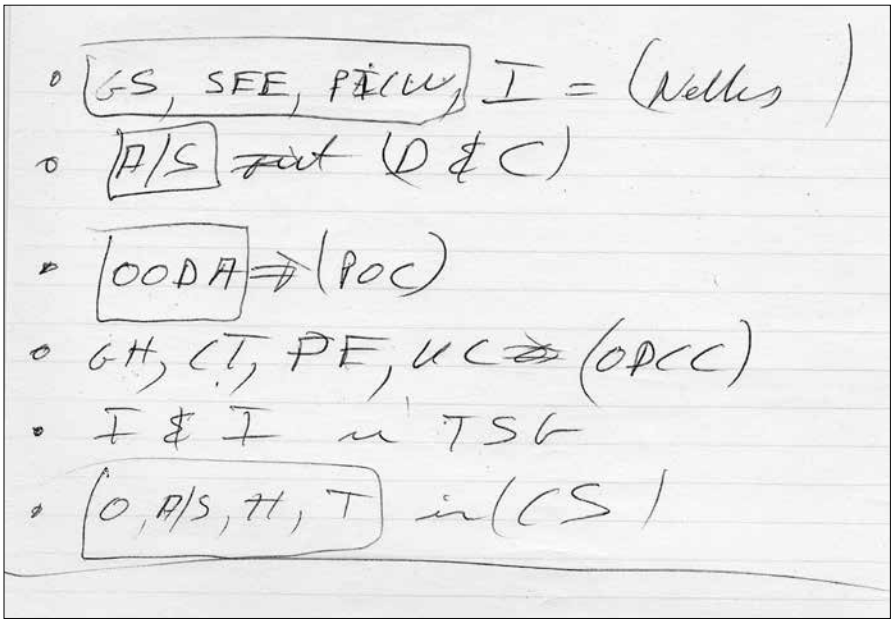
Figure 2 shows some of the variations that Boyd had considered for depicting the final loop. Figure 3 is a key that highlights which of his mental lines of inquiry, manifested in his different briefings, fed into each of the loop's components. "[A/S] = (D&C)" drew on his concept of analysis and synthesis in "Destruction and Creation." "[OODA] = (POC)" cites his regular references to the OODA loop as a process for creating mismatches in "Patterns of Conflict." "GH, CT, PE, UC = ODCC" highlights the different filters applied in the loop's orientation phase—genetic heritage, cultural tradition, previous experiences, and unfolding circumstances—upon which Boyd elaborated in his presentation "Organic Design for Command and Control." "I&I" refers to the

Figure 2. Original OODA loop handwritten drafts developed by Boyd for the "Essence of Winning and Losing" presentation



Source: "OODA Loops [Handwritten Draft of the 'Essence of Winning and Losing']," folder 9, box 7, Col John R. Boyd Papers, HD Archives.

Figure 3. Handwritten key to OODA loop components from draft notes for "Essence of Winning and Losing" presentation



Source: "OODA Loops [Handwritten Draft of the 'Essence of Winning and Losing']," folder 9, box 7, Col John R. Boyd Papers, HD Archives.

duality of interaction and isolation he described in the briefing "The Strategic Game of ? And ?" Finally, "[O, A/S, H, T] in (CS)" captures Boyd's description of the scientific process—observations, analyses/synthesis, hypothesis, and test—as an analog to the OODA loop in the "Conceptual Spiral" presentation. These few lines demonstrate that the OODA loop was the ultimate consolidation—not the origin—of the different ideas on conflict and survival that he developed over decades of study.

While the errors of *The Blind Strategist*'s early chapters may seem relatively marginal, they foreshadow far more significant issues—generated by the same decision to omit or truncate available archival sources and historiography—that manifest themselves in the middle section of the book. Moreover, in chapter 1 Robinson prefigures another common problem in Boyd critiques, noting almost as an aside that "[William] Lind . . . more than anybody else defined maneuver warfare to the wider world."[12] Conflating Lind's ideas and influence with Boyd's is not a new phenomenon, and Robinson carries that trend forward in his own narrative. Lind recurs frequently, sometimes as a muddled stand-in for Boyd. In other instances, however, Lind is inserted as a vector by which to bind Boyd by mere association to controversial concepts otherwise unconnected to Boyd's own ideas; this will also be discussed shortly.

Chapters 3–6 form the evidentiary crux of Robinson's argument, and the strictly historical analysis throughout these chapters are the book's strongest part. Robinson's original thesis largely collapses when he applies this historical analysis to Boyd's theories. Chapter 3 unpacks the self-serving postwar memoirs of German *Wehrmacht* generals such as Franz Halder, Heinz Guderian, Erich von Manstein, Hermann Balck, and Friedrich von Mellenthin. Chapter 5 covers *Wehrmacht* operations in World War II writ large, whose supposed effectiveness and cohesion gained mythical status. Chapter 6 reviews how myths of the blitzkrieg found their origins in equally mythical Western perceptions of German infiltration or "stormtrooper" tactics from World War I. Standing somewhat apart from the German narrative is chapter 4, which covers the problems in Basil Liddell Hart's historical analysis and strategic writing. Hart was a British officer and theorist, but his experiences in the First World War deeply influenced his postwar writings, which aimed to avoid another such bloodletting. Following World War II, Hart would also attempt to claim intellectual credit for blitzkrieg. Many of the problems in both the German narratives and Hart's self-promotion are documented in other works, but Robinson effectively collects those arguments to set the stage for his core critique of Boyd.

However, in analyzing the impact of those arguments on Boyd's own work, Robinson's thesis unravels in several ways. In chapter 6, the author comes closest to making his case by describing a number of exchanges between Boyd,

some of his associates, and former German generals Mellenthin and Balck during a series of conferences conducted in the United States in 1979 and 1980. These conferences provided Boyd, Lind, and others in the maneuver warfare and military reform movements the opportunity to validate their tentative ideas with the best-alleged practitioners of them. But in questioning Mellenthin and Balck on everything from mission tactics to blitzkrieg to arguments of maneuver versus attrition, Boyd's group found that the Germans contradicted many of their presuppositions.[13] Robinson argues that, by Boyd's own professed intellectual standards, Boyd should have revised and modified his theories based on this new information. Instead, Boyd, Lind, and the rest remained in a "fantasy world" with their ideas unchanged.[14] This is a damning charge, and Robinson's quotations from those conferences raise entirely valid questions about the integrity of a conflict theory that relied heavily on ideas disproven by their own alleged practitioners.

Yet, Robinson's own standard is absent from his subsequent assessment of Boyd's ideas from this point onward, because he does not revisit later versions of Boyd's brief to prove that Boyd indeed "ignored and misrepresented damning evidence."[15] This omission undercuts Robinson's allegation that Boyd was not only a poor historian but was also deliberately deceiving his later audiences. The charge that Boyd's motive was one of conscious misrepresentation permeates *The Blind Strategist,* and it requires a significantly higher evidentiary standard than a mere charge of poor historical craft.[16] Robinson fails to provide such evidence in his subsequent analysis of those conferences' impact.

To critique Boyd's "fantasy world," he relies exclusively on a 1978 version of "Patterns of Conflict," delivered before these key interviews with the German commanders in 1979 and 1980. This is problematic, because as noted above and by Robinson's own observation, Boyd constantly updated his briefings nearly to the time of his death. The Boyd papers at the HD Archives include 33 separate slide versions of "Patterns of Conflict," with several dated after the 1979/1980 series of conferences.[17] This is in addition to numerous editions of Boyd's other briefings—"Organic Design for Command and Control," "The Strategic Game of ? and ?," "Conceptual Spiral," and "The Essence of Winning and Losing"—which combined amount to 44 different versions, all of which are dated after 1980 (with the last update marked as 28 June 1995).[18] Thus, the preponderance of Boyd's work on conflict, competition, and decision making came *after* the 1980 conference on which half of *The Blind Strategist*'s argument hinges; and this work goes completely unexamined in Robinson's book.[19] Nor does this tally count the innumerable variations in presentation that likely occurred in stride as Boyd briefed different audiences. Chapter 6 offers the strongest potential line of criticism on the foundations of Boyd's theories; yet omitting the entirety of Boyd's post-1980 work renders the charge that Boyd never reexamined his ideas

unsupported and the more sensational charge of deliberate deception entirely spurious.

It is in the characterization of Boyd's views on Basil Liddell Hart, however, that this omission fatally undermines *The Blind Strategist*'s argument. There exist fewer recorded copies of Boyd presenting "Patterns of Conflict" than slide versions; but enough exist to gain a clear sense of what Boyd thought of his various sources outside the slide text, specifically Hart. In characterizing Hart's influence on Boyd, Robinson is unambiguous: "heavily influenced," "uncritically accepted," and "trusted another deceiver" number among the epithets.[20] Absent in the evidence supporting these characterizations are Boyd's own words on the subject. Yet, Boyd shared specific comments on Hart, and one can find these comments in two recordings of "Patterns of Conflict" made after 1980. The first comes from an iteration of the brief given around 1986 to congressional staffers. Early on, Boyd calls out Hart's internal intellectual confusion: "another notion here, primarily attributable to . . . Liddell Hart. Operate in a line, or operate in a direction that threatens alternative objectives . . . I'll also point out, Liddell Hart didn't even understand his own idea. I'll bring that out later on."[21] Boyd indeed brought out his opinion on Hart later on; it was scathing and unambiguous:

> For you people who have read Liddell-Hart, I can give you a much better book. Liddell-Hart's book, I think it's a lot of garbage . . . how many people have read Liddell-Hart's *Strategy and the Indirect Approach*? Remember, we talked about the indirect approach being dislocation, and dislocation being the indirect approach. My God, he's got circular reasoning—he's going to dislocate a guy's mind. You don't dislocate a mind—you disorient it! He talks about dislocation . . . he's [*sic*] chiropractor of war![22]

Hart's ideas were sufficiently "garbage" that in a later recording of "Patterns of Conflict"—dated 1989, and given to a Marine Corps Command and Staff College audience—Boyd's passing references to them damn with faint praise: "in fact, how many people have read Liddell Hart's book, *Strategy*? I don't necessarily recommend it too highly."[23] Boyd later cites an interview Hart conducts with German general Gerd von Rundstedt in *The German Generals Talk*, but he observes it was "one of the few good things I found in his book."[24] If volume of citation is any indication, Hart did not heavily influence "Patterns of Conflict" in any meaningful fashion beyond acting as a foil for theorists whom Boyd found more worthy of attention. In the 1989 version, Boyd cites Hart by name only six times, and as seen above, not favorably; and Boyd does not quote Hart's famous term *indirect approach* once. In contrast, the 1989 brief has Boyd citing

Sun Tzu by name 37 times; Sun Tzu's concept of *cheng/chi* 30 times; and Prussian theorist Carl von Clausewitz by name 46 times.[25] Basil Liddell Hart barely registered on John Boyd's radar when compared to the sages of ancient China and nineteenth century Europe. There is no reconciling Boyd's dismissal of Hart as "garbage" with the book's presentation of the British thinker as fundamental to Boyd's theories. And it is here that Robinson's failure to leverage the available archival and historiographic evidence wipes out *The Blind Strategist*'s argument.

The final section of the book is a broad indictment of American military strategy and performance from the 1980s onward, viewed through Robinson's lens that Boyd was a conduit for the malign ideas of Hart and the German generals. But the deep flaws in *The Blind Strategist*'s central thesis, as outlined above, make the arguments in the book's last part unconvincing. The remaining chapters examine "operational art," the alleged influence of maneuver warfare on North Atlantic Treaty Organization (NATO) defense plans for Europe, Operation Desert Storm, the Global War on Terrorism, and finally "fourth-generation warfare."[26] The trends of selective or omitted historiography and conflation of Boyd with others in his circle continue throughout. Robinson repeatedly quotes and critiques William Lind's views on maneuver warfare, Hart, the German generals, and other things, with Boyd's own words frequently missing from the discussion.[27] Chapters 8 and 11—on the defense of NATO and Lind's "fourth-generation warfare" construct respectively—are superfluous in a book claiming Boyd's ideas as its focus. In the latter case, Robinson opens the chapter by stating, "Lind's fourth generation framework is truly his own creation and it did not originate from Boyd."[28] Despite Boyd's absence, Robinson devotes a full chapter to deconstructing Lind's theory. His conclusion that "Lind's prophecies of unstoppable fourth generation forces never materialized" implies that Lind's failed prognostication is sufficient to undercut Boyd's separate conflict framework simply by the personal association between the two men.[29] The chapter on NATO's defense is equally removed from Boyd's ideas, with Boyd not once mentioned by name or cited across 30 pages discussing U.S. Army general William E. DePuy's "Active Defense" doctrine, and William Lind's critique thereof.[30] Indeed, aside from yet another opportunity to critique Lind, chapter 8 largely reads as a vector to inject the racialist perspectives of the German generals toward the Soviet military's "Slavic-Mongol hordes" adjacent to the wider critique of Boyd and allow the reader to make their own mental association.[31]

Though there are a number of other problematic interpretations of Boyd and modern conflict in the later chapters, all fall under the book's central failure: selective use or entire omission of pertinent historiography and archival sources. Having surveyed these failures throughout this review, Robinson's conclusion rings hollow in the face of the evidence: "[maneuver warfare's] foun-

dational base [is] built upon the deception of *Wehrmacht* generals and Liddell Hart as well as Boyd and Lind's evasion of Balck and Mellenthin's inconvenient testimony which rejected the fundamentals of the theory."[32] This conclusion stands only if one freezes Boyd in place in 1980; ignores 17 additional years of conceptual refinement that followed the 1980 meeting with Mellenthin and Balck and which is evident in the archival holdings; and selectively uses the recent historiography, which has sought to bring more of those holdings into scholarly discourse. Far from its claim to be a "detailed evidence-based investigation," *The Blind Strategist* undertakes the very evidentiary gymnastics of which it accuses Boyd.[33] This is unfortunate because, as stated at the beginning of this review, there remains a vast quantity of untapped material in the Boyd papers that would greatly enhance the scholarship on the subject. No one has yet written the "definitive Boyd," be it a lifetime intellectual assessment based on all the archival material, or an exhaustive study of Boyd's impact on the totality of American military thought. Recent works have captured pieces of the puzzle; but this reviewer knows firsthand just how much archival material exists in the Boyd collection remaining to be processed, assessed, and made publicly accessible. *The Blind Strategist* was an opportunity to dig into that material and provide new insights on Boyd's ideas, inclusive of strengths and weaknesses. Instead, it stands as an opportunity missed, putting its own blinders on a deeper understanding of Boyd's thought. Readers will need to wait for another work to advance that understanding further.

Endnotes

1. Robert Coram, *Boyd: The Fighter Pilot Who Changed the Art of War* (New York: Bay Back Books, 2002), 7.
2. Stephen Robinson, *False Flags: Disguised German Raiders of World War II* (Dunedin, NZ: Exisle Publishing, 2016); and Stephen Robinson, *Panzer Commander Hermann Balck: Germany's Master Tactician* (Dunedin, NZ: Exisle Publishing, 2019).
3. Daniel Ford, *A Vision So Noble: John Boyd, the OODA Loop, and America's War on Terror* (Durham, NC: Warbird Books, 2010); John Andreas Olsen, ed., *Airpower Reborn: The Strategic Concepts of John Warden and John Boyd* (Annapolis, MD: Naval Institute Press, 2015); and Frans P. B. Osinga, *Science, Strategy and War: The Strategic Theory of John Boyd* (New York: Routledge, 2007).
4. Ian T. Brown, *A New Conception of War: John Boyd, the U.S. Marines, and Maneuver Warfare* (Quantico, VA: Marine Corps University Press, 2018).
5. Stephen Robinson, *The Blind Strategist: John Boyd and the American Art of War* (Dunedin, NZ: Exisle Publishing, 2021), 18.
6. Robinson, *The Blind Strategist*, 11, 30. Robinson does observe in an endnote that Boyd stated that the OODA loop came from the YF-16 and YF-17 fly-off tests; see Robinson, *The Blind Strategist*, 321. However, Robinson does not inject this rather salient observation by the OODA loop's creator anywhere in the main body of the book's text, reiterating instead the Korean War version of the loop's origin.
7. Roger Spiller, "Critique of John Boyd's 'Patterns of Conflict'," undated, folder 6, box 7, Col John R. Boyd Papers, Marine Corps History Division Historical Resources Branch, Quantico, VA, hereafter HD Archives. Though the Spiller critique is undated,

it references another critique of "Patterns of Conflict" by Jay Luvaas (then a history professor at West Point Military Academy), which is dated in 1981, so it is fair to assume Spiller's critique was also written in 1981 or shortly thereafter. See also Jay Luvaas, "Patterns of Conflict in History," 9 March 1981, folder 5, box 7, Col John R. Boyd Papers, HD Archives.

8. Osinga, *Science, Strategy and War*, 229.
9. Osinga, *Science, Strategy and War*, 20–127.
10. Robinson, *The Blind Strategist,* 179.
11. "OODA Loops [Handwritten Draft of the 'Essence of Winning and Losing']," folder 9, box 7, Col John R. Boyd Papers, HD Archives.
12. Robinson, *The Blind Strategist,* 47. Robinson quotes Lind extensively many times throughout the book, but he rarely makes the distinction that Lind's views on maneuver warfare were not clones of Boyd's; examples of Lind's views can be found in Robinson, *The Blind Strategist*, 19, 62, 66–67, 131, 189, 221, 240, 286. For an extensive discussion on the frequent conflation of Lind's ideas with Boyd's in the maneuver warfare debate, see Brown, *A New Conception of War*, 145–48.
13. Robinson, *The Blind Strategist*, 162–66.
14. Robinson, *The Blind Strategist*, 180, 183.
15. Robinson, *The Blind Strategist*, 18.
16. In addition to the above quote, Robinson states that Boyd "ignored . . . devastating testimony'; "ignored . . . evidence"; "followed the path of least resistance"; "inconceivable that Boyd casually read his sources and never noticed the critical anomalies"; engaged in a "refusal to update and modify [his] ideas"; "ignored damning evidence"; "injected enormous amounts of disinformation into his synthesis"; "[refused] to deal with problematic evidence"; "refused to use . . . testimony as an opportunity to revise maneuver warfare"; "guided by . . . confirmation bias"; and undertook "evasion of . . . inconvenient testimony"; Robinson, *The Blind Strategist*, 20, 180, 181, 182, 183, 301, 305.
17. "John R. Boyd: A Register of His Papers, 2020," Col John R. Boyd Papers, HD Archives.
18. "John R. Boyd: A Register of His Papers, 2020."
19. Robinson acknowledges the *existence* of briefings developed by Boyd after the 1980 conference; see Robinson, *The Blind Strategist,* 46. However, a cross-reference of Robinson's endnotes shows that he makes no use whatsoever of these later briefings or later versions of "Patterns of Conflict"—with one exception—in his analysis of Boyd's concepts. The only verbal version of "Patterns of Conflict" referenced is the 1978 version, which predates the conferences (see Robinson, *The Blind Strategist,* 306). Robinson does refer to the 1986 version of the *slides only* for "Patterns of Conflict" (Robinson, *The Blind Strategist*, 306); however, as noted throughout this essay, the slides in and of themselves do not capture the volume of additional details Boyd delivered verbally in his presentations, and the extant recordings of "Patterns of Conflict" referenced in this essay clearly demonstrate that Boyd expressed critical opinions of some of the theorists referred to in the slides like Hart.
20. Robinson, *The Blind Strategist*, 11, 19, 104.
21. John R. Boyd, "Patterns of Conflict," transcript of lecture to staff of Representative Jim Lightfoot, ca. 1986, part 4 (16 YouTube videos), transcribed by Shawn Callahan from 2014–20, 24, hereafter Callahan transcript. This reviewer is deeply grateful to Mr. Callahan for generously sharing his work.
22. Boyd, "Patterns of Conflict," Callahan transcript, 57.
23. John R. Boyd, "Discourse on Winning and Losing," transcript of lecture to U.S. Marine Corps Command and Staff College, 25 April 1989, tape 1, side 2 (8 audio cassette tapes/8 compact discs), HD Archives, 25. Note that the audio transcript is labeled as "Discourse on Winning and Losing," but it is in fact an audio transcript of Boyd presenting his lecture, "Patterns of Conflict." The author has retained the label in citations for ease of use by other researchers.
24. Boyd, "Discourse on Winning and Losing," 166–67.

25. Boyd, "Discourse on Winning and Losing."
26. Robinson, *The Blind Strategist*, 287.
27. Robinson, *The Blind Strategist*, 189, 221, 240, 286, 287–99.
28. Robinson, *The Blind Strategist*, 289.
29. Robinson, *The Blind Strategist*, 299.
30. Robinson, *The Blind Strategist*, 214–41.
31. Robinson, *The Blind Strategist*, 219–25.
32. Robinson, *The Blind Strategist*, 304–5.
33. Robinson, *The Blind Strategist*, dust jacket.

Russian Cyber Operations: Coding the Boundaries of Conflict. By Scott Jasper. Washington, DC: Georgetown University Press, 2020. Pp. 232. $32.95 (hardcover and ebook).

Internet and computer technologies have become not merely part and parcel of our daily lives but have also been incorporated into the infrastructure that maintains modern civilization. The very communications systems that now enable improved capabilities for industries such as banking, government, and energy also make them vulnerable to attacks by bad-faith actors. In *Russian Cyber Operations: Coding the Boundaries of Conflict*, author Scott Jasper documents the ways in which the security services of the Russian Federation have made use of the internet to strike out against their neighbors and attempt and tilt the balance of power in their favor, while avoiding the consequences that more traditional military actions may have drawn.

The book integrates knowledge from several fields, most prominently international law and cybersecurity, as the author places before readers an ominous chronicle of growing Russian aggressiveness on the internet stage that mirrors the country's descent into authoritarianism and aggression on the real-world stage. Much as it has employed proxy movements in Ukraine and Georgia, the Russian Federation has directed groups of citizen hackers and criminal organizations to promote its propaganda, vandalize websites, and even sabotage power networks in Ukraine and the United States.

Jasper argues persuasively that while the Russian government pretends to promote treaties and codes for responsible internet action by states, in practice it repeatedly acts to undermine and breach the very standards it promotes. The actions of Russian-backed hackers are carefully measured and planned to not only avoid formal responsibility for the Russian state but also cause just enough damage to disrupt and harm Russia's adversaries, yet not enough to qualify as military action under current international law.

The author makes a range of suggestions for fortifying the West's cybernetic bulwarks. Some are active measures, such as sanctions against Russian officials and entities involved in cyberattacks and counteractions against the computers used to perform the attacks. Others are in the dimension of reform, where

Jasper contends that improved cooperation between government agencies and the operators of key computer infrastructure would form a part of the solution, with security agencies providing companies with intelligence on expected attacks or technical knowledge that would aid in stopping or mitigating them. Currently, the author argues, cybersecurity experts are not paying enough attention to the issue of network resilience, the measures taken to minimize the damage of cyberattacks if, or rather when, they succeed.

The book does suffer from some flaws, chiefly related to the issues of methodology. It becomes apparent early on that it is the author's objective to demonstrate an imminent Russian threat to Western infrastructures and institutions. While this is a broadly correct argument, in the creation of this demonstration the author makes several omissions and conflations. As often happens in the literature of cyber warfare, Jasper conflates acts of sabotage and disruption of crucial infrastructure with acts of propaganda and even political cooperation between Russian authorities and Western political parties and activist organizations. While those actions can be hostile and disruptive, to define them as cyberattacks or military actions seems to extend existing definitions in a hazardous manner.

The author's account of events, too, take on faith interpretations offered by some sources and omit conflicting interpretations. For example, in his discussion of Russian intelligence agencies using vulnerabilities in common Microsoft software to sabotage the Ukrainian electric grid, Jasper repeats the U.S. National Security Agency's claim that the fact that the agency was aware of those vulnerabilities for years and did not disclose them was not at issue in the incident since the information was released two months before the hack (pp. 105, 125). This ignores the fact that it often takes months and even years for organizations to fully adjust their defenses after a vulnerability is revealed.[1] Elsewhere, the author cites reporting by the cybersecurity technology company CrowdStrike of Russian intelligence allegedly using lax security practices by Ukrainian artillery officers to locate and strike Ukrainian artillery batteries and does not even mention that the Ukrainian military entirely denied that these events ever took place (p. 79).[2]

Another significant difficulty that one encounters while reading *Russian Cyber Operations* is the author's lack of access to Russian-language sources. Russian sources quoted in the book are either those available in translation or the interpretations of Russian doctrine by various analysts in the West. In some cases, this leads to unintentional distortion, such as the citing of Evgeny Messner, a white Russian émigré military analyst, as a radical Russian military thinker in the same paragraph as a range of Soviet and post-Soviet military analysts, which could cause readers to perhaps overestimate Messner's role in formation of Soviet and post-Soviet strategic thought (p. 74). This poses sub-

stantial issues to those seeking to understand the motivations behind Russia's aggressive policies.

These flaws, however, should not blind readers to the important benefits of Jasper's work. *Russian Cyber Operations* is not intended as a work of history but rather as a work of policy. In this context, it provides a clear and succinct summary of the international situation regarding the confrontation between Russia and the West, and it offers a range of clear-headed, moderate solutions that could apply to defending Western infrastructure and institutions against not only Russian cyberattacks but also a range of other threats. In addition, the book provides a general framework for analysis of other future threats, which comes in the form of a well-structured analysis of a threat's activities, capabilities, and motivations, as well as the existing defenses that are already available. Anyone interested in the issues of cyber warfare and cybersecurity policy would do well to understand the framework demonstrated in this book and would benefit from reading it.

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Endnotes

1. Andrew Marrington, interview with author, 22 May 2021.
2. See Dmitry Zaks, "Ukraine's Military Denies Russian Hack Attack," Yahoo! News, 6 January 2017.

An Army in Crisis: Social Conflict and the U.S. Army in Germany, 1968–1975. By Alexander Vazansky. Lincoln: University of Nebraska Press, 2019. Pp. 348. $60.00 (hardcover and ebook).

The year 2020 was one of racial, social, and political upheaval in the United States. The U.S. military did not escape this wider societal trend, and the individual Services found themselves confronting accounts of systemic racism and misogyny from Service members of almost every rank. The U.S. Army, in particular, confronted racist components of its legacy. Debate raged among civilian leadership on whether it was appropriate to have most of the Army's largest installations named for military leaders of the Confederate States of America, a pro-slavery rebellion. These times of turmoil are not without precedent. In the late 1960s and early 1970s, the United States was beset by a convergence of social unrest stemming from the civil rights movement and popular opposition to the Vietnam War. The effects of this unrest were particularly pronounced

within Germany and the American soldiers under the command of U.S. Army Europe.

In *An Army in Crisis*, Alexander Vazansky, a history professor at the University of Nebraska–Lincoln, examines the U.S. Army Europe crisis during this period in three interrelated sections: racial strife, political struggle, and drug problems. Vazansky's thesis is that the social crises among U.S. Army formations in Germany stemmed from the diminished importance of the Army in Germany due to an increased focus on Vietnam, a transition in the relationships between the people of West Germany and the U.S. Army forces stationed there, and social unrest in the United States at that time. To argue his case, the author organizes *An Army in Crisis* into three sections. The first addresses racial strife between the large population of Black soldiers and their overwhelmingly White leaders. The second examines the contribution of antiwar and political opposition movements toward strife within the ranks of U.S. Army Europe. The third examines the problem of drug abuse by American soldiers in Germany.

An Army in Crisis is, at its core, a story about the leadership of General Michael S. Davison. After taking command of U.S. Army Europe in 1971, Davison immediately began implementing policies that publicly acknowledged the extent of the Army's social issues and sought dialogue with soldiers to provide an outlet for grievances within his command. These activities were in stark contrast to the approach of his predecessor, General James H. Polk, who avoided publicizing any of the Army's problems and took a zero-sum, zero-tolerance approach to misconduct. In Vazansky's telling, Polk's approach was to avoid addressing problems of race directly, seeking to avoid recognizing the problems confronted by Black soldiers. Davison, on the other hand, saw intra-unit racial strife as a command problem. He pressured subordinate commanders to hear and acknowledge the issues of Black soldiers and to ameliorate problems wherever they were found.

Davison took a similarly progressive approach toward drug use among soldiers. Recognizing the pervasive nature of illegal drug use by U.S. Army Europe soldiers, he sought every opportunity to implement amnesty and rehabilitation, instead of punishment, for drug users. The command encouraged soldiers to acknowledge drug problems and seek treatment, generally without penalty, decreasing the soldiers' inclination to conceal addiction to avoid punishment. Later surveys indicated that U.S. Army Europe was unsuccessful in significantly reducing the rate of illegal drug use, but Vazansky contends that Davison's approach increased trust, improving the command climate between leaders and soldiers at multiple echelons.

Under Davison's command, U.S. Army Europe did not seek to resolve institutional racism or to repair the structural contributions to drug use. Instead, it sought to treat second-order symptoms. Constraining commanders' ability to

confine accused wrongdoers before their trial, improving Army chow, remodeling housing, and increasing morale, welfare, and recreation opportunities were instrumental in decreasing the number of incidents. As these base considerations of Abraham Maslow's hierarchy of needs were addressed, political groups seeking to foment resistance within the ranks found little traction for their movement within U.S. Army Europe, despite a Vietnam War-era political climate in both the United States and Germany that was less than friendly toward senior military leaders.

The first section of *An Army in Crisis*, detailing racial strife, is by far the author's strongest. Vazansky provides a vivid description of the disparity in treatment of Black soldiers by the largely White leadership, as well as the degrading effect that this treatment had on unit morale and cohesion. According to Vazansky, the specter of active-duty soldiers participating in radical African American empowerment organizations such as the Black Panther Party ultimately enabled more concessions on the part of the white commanders to Black soldiers. While the Black Panther Party of the late 1960s and early 1970s is considerably different than the Black Lives Matter movement of today, there are certainly echoes of that earlier era in the present day. Rightly or wrongly, many of the U.S. military's institutional leaders clung to a philosophy of "colorblindness" in the face of well-documented cases of police violence against African Americans, public protests, and widespread accounts of systemic racism. This attitude seems markedly similar to Vazansky's characterization of General Polk's failed approach while serving as commander of U.S. Army Europe. Military leaders confronting racial unrest in the ranks today would be well-served to examine *An Army in Crisis*.

Vazansky's book is not without structural shortcomings. Though *An Army in Crisis* establishes three interrelated reasons as creating the crisis in U.S. Army Europe—social unrest in the United States, the shifting relationship between American soldiers and their German hosts, and the hollowing effect of the Vietnam War—it spends little time examining the extent of the impact of Vietnam. The book cites personal interviews with senior leaders of U.S. Army Europe during the period who describe Germany as little more than a source of replacements for Vietnam, but it does not examine the phenomenon in greater detail. Such an exploration would certainly be useful for contemporary military leaders whose units orient toward a region of lesser strategic significance. A second shortcoming, which Vazansky acknowledges, is that the creation of an all-volunteer military force in the United States and new investment in U.S. Army Europe both occurred in the 1970s, as the United States withdrew from Vietnam and the war ended there. It is nearly impossible to isolate the efforts of Davison in quelling unrest within his command from the impact of these

American policy shifts, since the arrival of more interested and better-trained soldiers, an improvement to facilities and training, and a revitalization of the strategic importance of U.S. soldiers in Germany all led to an increase in morale, and a decrease of conflict, within U.S. Army Europe.

An Army in Crisis is a useful study of military leadership during an internal crisis, and it is a worthwhile read for today's institutional leaders. Contemporary military reading lists are chock-full of biographies and accounts of leadership in active conflict. The professional study of war ought to expand works such as Vazansky's, which describe the hard-won experience of transformational leadership in what might seem like the periphery.

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The Senkaku Paradox: Risking Great Power War over Small Stakes. By Michael E. O'Hanlon. Washington, DC: Brookings Institution Press, 2019. Pp. 272. $27.99 (paperback); $16.49 (ebook).

Studying the reasons why wars start grants us the opportunity for reflection and the application of retroactive logic. We can recognize instances of large wars beginning from issues deemed minor. From the assassination of an archduke to the takeover of an uninhabited island, getting into a large war over small stakes is a dilemma all great powers face. Michael E. O'Hanlon titles his book, *The Senkaku Paradox: Risking Great Power War over Small Stakes* after the disputed Senkaku Islands, currently administered by Japan but claimed by both Japan and China. Previous presidential administrations in the United States have stated publicly that these islands are covered by the U.S.-Japan Security Treaty (1951). If one of the Senkakus is taken by a small Chinese contingent, the event could escalate and lead to a major war. Alternatively, O'Hanlon notes, if one of the islands is taken and the United States does not respond, that inaction could embolden China and/or other adversaries to take further aggressive actions.

Three scenarios are constructed, each one more escalatory than the next: 1) the takeover of one of the Senkakus; 2) a takeover of an uninhabited (or sparsely inhabited) section of one of the Baltic states; and 3) a blockade of Taiwan. These scenarios highlight the initial difficulty of the paradox. The major fear is going to war over "small" stakes, but the best way to deter conflict is to show strong resolve; anything less could increase the adversary calculation that the odds are

in their favor. None of the above scenarios would be considered "small" by an ally of the United States, and a U.S. response that they are "minor" incursions would certainly be at least politically problematic. There is an obvious response from any ally: "Would the takeover of uninhabited parts of Alaska be 'small stakes'?" When considering U.S. military responses (not including a large mobilization), O'Hanlon argues that China and Russia would have strong incentives not to "fire the first shot," but that has arguably already been done in variations of the given scenarios (p. 6).

Deterrence, of course, has three necessary dimensions. The deterring power must have the capability to deter; the adversary must see the response happening as credible; and finally, both that capability and credibility must be communicated to the adversary. Any one of these factors could be the shortcoming that leads to deterrence failure. The dilemma of deterrence becomes even more problematic as O'Hanlon projects these three scenarios further into the future. Appendices on what he refers to as the "so-called revolution in military affairs" and forecasting capabilities into 2040 provide the reader with background into his assumptions. The author accurately notes that the ability of the United States to quickly reverse any of the above scenarios is already problematic and will become even more so in the future.

In *The Senkaku Paradox*, O'Hanlon argues that the United States should not change its declaratory policy of defending its allies, but that it needs to consider responses beyond direct military action. This is certainly true, but it again highlights the difficulty of response. Responses cannot look like they accept the new status quo, but neither can they be too escalatory. There are many "mights" and "maybes" in this analysis. O'Hanlon bounds these assumptions well, but they must always be kept in mind.

Rather than continue to fight the scenarios given, the book's strongest point is the development of possible U.S. responses. There is the correct, almost hackneyed, and extremely difficult recommendation of whole-of-government responses, to include the recommendation of integrating economic tools into war plans (chapter 5). O'Hanlon writes that some of these actions could be used prior to rather than in response to the scenarios discussed. This valuable point highlights actions below the level of armed conflict that may prove effective in either deterring action or (slowly) reversing adversary action. Such approaches include more effective use of U.S. economic levers, including denying access to the SWIFT architecture for electronic transactions that has been used against Iran. O'Hanlon does note that this tool is something of an extreme action and its use must be considered carefully, something that Henry Farrell and Abraham Newman confirm, with many countries finding workarounds.[1]

While the initial scenarios outlined above may be problematic, the discussion of more coordinated uses of other instruments of national power and their

incorporation into military planning is a valuable discussion for any student of international security.

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Endnote

1. See Henry Farrell and Abraham Newman, "America's Misuse of its Financial Infrastructure," *National Interest*, 15 April 2019.

Russian Cyber Operations: Coding the Boundaries of Conflict. By Scott Jasper. Washington, DC: Georgetown University Press, 2020. Pp. 232. $32.95 (hardcover and ebook).

Scott Jasper published *Russian Cyber Operations: Coding the Boundaries of Conflict* in an auspicious year. The discovery of the SolarWinds cyberattack and likely Russian culpability highlights the necessity for the United States to remedy its cybersecurity vulnerabilities. With clear prose and insight, Jasper traces the history of Russian cyber aggression that maps on to a coherent, revanchist strategy directed by Russian president Vladimir Putin. The book is essential reading to understand SolarWinds' place in Russian grand strategic thought, and it offers much-needed solutions to contest guaranteed Russian cyber operations in the future.

Jasper opens by grounding the book in a reality of geopolitical competition occurring beneath the threshold of armed conflict, dubbed the gray zone. The book's analytical framework, outlined in chapter 2, elucidates the dilemmas of cyber as a domain of conflict. Namely, opacity reigns and Russia exploits ambiguity to skirt responsibility or muddy attribution that could prompt a kinetic response. The remaining eight chapters are divided into three parts: cyber operations, security dynamics, and defensive solutions. Each chapter is anchored by illustrative historical case studies of cyberattacks or intrusions in Europe or the United States, beginning with a cyber operation against Estonia in 2007. The author weaves multiple strands of thought into the first two parts before concluding with policy prescriptions to deter Russian cyber aggression.

Jasper assembles a diverse array of sources to illuminate the often-shadowy world of cyberattacks. He blends official documents from the United States, journalistic accounts, scholarly publications, and reports by private-sector firms such as CrowdStrike and Symantec that conducted forensic analyses of Russian

cyber aggression. The book overcomes a methodological hurdle by incorporating, when possible, key Russian strategic theorists' writings in order to situate Russian cyber operations in a current of military thought. Jasper emphasizes that Russian armed forces general Valery V. Gerasimov is one among many notable Russian strategists whose intellectual contribution deserves recognition for shaping cyber policy. A reader finishes the book with an appreciation for Jasper's collection of materials to grapple with Russian cyber operations on their own terms and how the United States can defend against future cyber intrusions.

Part I, "Cyber Operations," outlines the recent history of Russian cyber operations to meet the country's strategic and information warfare goals in Estonia, Georgia, Ukraine, and the United States. Case studies from each country range from evidence of coercion, to setting the battlefield, to political meddling. Russia's neighbors served as unwitting test beds for malicious cyber activities before the Internet Research Agency (IRA) and Moscow's intelligence agencies graduated to more sophisticated actions. IRA meddling in the 2016 U.S. presidential election testified to the persistence of Russian cyber aggression and the difficulties of timely attribution that the Kremlin capitalized on to shirk blame to wage information warfare. Jasper argues that Russian cyber operators' tactics, techniques, and procedures "give Moscow a means" to preserve "a degree of plausible deniability" as victims struggle to impose costs or deter the Kremlin's cyber campaigns (p. 72).

Part II, "Security Dynamics," delves into the intellectual and strategic rationale for Russian cyber policy and explains why the United States' legal responses have left Russian policymakers "amused by the attention but not deterred" (p. 123). Dubbing Putin a rational state actor, Jasper links Russian cyber activities to a revanchist grand strategy that inflicts pain on its neighbors and destabilizes other states that stymie Putin's ambition. For example, Moscow dispatched NotPetya malware in 2017 with the sole intent of wreaking havoc on Ukraine's economy and government. The incident demonstrated a Russian willingness to flaunt norms that went unpunished. The United States thus far faced an inability to calibrate a proportionate retaliation or deter Russian actions in cyberspace. Jasper presciently writes that the U.S. Department of Defense's "Defend Forward" policy, however impressive in adopting an offensive posture, failed to provoke a change in Russian decision making.

Part III, "Defensive Solutions," moves from diagnoses to technological and policy prescriptions to combat Russia's cyber activities. Jasper advocates for a defense-in-depth strategy bolstered by technological solutions to counter the threats emanating from Russia and other malicious actors. He emphasizes that resilience against the daily battering of cyberattacks demands an automated defensive apparatus to deny adversaries the ability to infiltrate networks. One

question emerges when considering the feasibility of defensive answers to deter cyber espionage or attacks: can a defend-in-depth strategy convince adversaries that cyber operations are fruitless when adversaries will continually innovate? Cybersecurity experts and policy makers confront this and other questions when seeking how to balance the response to SolarWinds that will shape the contours of the United States' future cyber offense and defense balance.

One of this book's signal contributions extends beyond the domain of cybersecurity and into the terrain of Russian grand strategy. Jasper excels when demonstrating how Russian cyber operations are a vehicle for Putin's grand strategy to restore Russia's place among leading global powers. Putin's revanchist grand strategy should not, the book illustrates, be read as an unsophisticated reassertion of Russian power conducted without rationale. On the contrary, Russian strategists have conceptualized innovative doctrine, employed hybrid warfare, and pioneered emerging technologies for strategic ends. A reader draws the conclusion that the history of Russia's cyber operations should be viewed through the lens of a coherent strategy that bolsters Putin's drive for geopolitical standing. To adapt Prussian military strategist Carl von Clausewitz's simplified maxim, this book persuades a reader that cyber operations are the continuation of Russia's geopolitics by other means.

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Farwell's Rules of the Nautical Road, 9th ed. By Craig H. Allen Sr. and Craig H. Allen Jr. Annapolis, MD: Naval Institute Press, 2020. Pp. 560. $64.95 (hardcover).

When I arrived at the U.S. Naval Academy in 1977, *Farwell's Rules of the Nautical Road* was on its fifth edition. Since 1941, this handbook has ranked high among the most essential books for aspiring mariners and esteemed ship captains alike. Yet, the world is vastly different from four decades ago. Improvements in technology, increased maritime traffic, updates to the 1972 International Regulations for Preventing Collisions at Sea (COLREGs), and increased automation all converge to make navigating the world's oceans even more challenging than ever. The ninth edition brilliantly updates this classic handbook for today's mariner.

The challenges posed by the complexity of sailing the seas today makes it

more clear than ever that there is no substitute for naval officers to master the rules of the nautical road. As we have seen so many times before, the consequences of not doing so can be tragic.

Early in nautical education, seamanship and navigation instructors often referred to the term *Hobson's choice* when describing the significant responsibility and accountability that commanding officers and watch officers are charged with on the bridge of their ships. Hobson's choice frequently came up in conversation both in the classroom and on the deck plate. Made famous and kept alive by a compelling article published in the *Wall Street Journal* in May 1952, Hobson's choice was a metaphorical link between an old English businessman and the collision of the aircraft carrier USS *Wasp* (CV 18) and the destroyer-minesweeper USS *Hobson* (DMS 26) in the Atlantic on 26 April 1952.

The Englishman, Thomas Hobson, was a stable owner in Cambridge, England, in the seventeenth century. He astutely recognized that his best horses were in the most demand and were therefore the most overworked. When a customer came to ride one of his horses, Hobson offered only the horse in the stall closest to the entry of the stable. Hence, the term Hobson's choice was coined, meaning that there is in actuality no real choice.

On the fateful night of 26 April 1952, *Wasp* had just finished the launch and recovery of aircraft on its way to the Mediterranean. All ships in the formation were "darkened ship," with no running lights on. Upon repositioning to continue the transit after *Wasp* recovered its aircraft, Hobson turned sharp to the left, cutting in front of *Wasp*'s 40,000 tons of steel and being struck by the much larger aircraft carrier. Hobson was cut in half and sank in less than five minutes with 176 souls lost, a tragic end for a ship that had heroically conducted support fires for the D-Day landings in France and survived Kamikaze attacks in the Pacific during World War II.

Two weeks later, the *Wall Street Journal* reported on a public dilemma that stemmed from the consequences of the collision, the loss of the ship and so many lives, and the fact that Hobson's commanding officer, U.S. Navy lieutenant commander William J. Tierney, went down with his vessel. Articulate but frank, the *Wall Street Journal* presented a Hobson's choice as follows:

> It is the story of command at sea and the Navy tradition that with responsibility goes authority, and with them goes accountability. The burden on the "Captain" in these circumstances is beyond description; in the hour of emergency or peril at sea he can turn to no other man. But his role in training his officers to stand in his place on the bridge as "Officer of the Deck" to make critical decisions in his absence is the ultimate measure of his leadership. Bad decisions have irreparable consequences. The training and discipline of this experi-

> ence for young officers is overwhelming and never forgotten. The cruel business of accountability is a "tradition of the sea," older than the traditions of the country itself and wiser in its age than this new custom that men should no longer be held responsible for what they do as well as for what they intend.[1]

Ultimately, in a Navy court of inquiry, Tierney was found to have committed a grave error in judgment and was deemed solely responsible for the collision. As difficult a decision as this was for the court to make, the Navy has upheld the tradition and burden of a commanding officer's accountability ever since.

Whereas commanding officers are taught this and other forms of case studies in accountability on the high seas, it is by no means enough. With more than 90,000 vessels sailing the world's oceans today, it is essential to govern the global waterways with internationally accepted rules. Yet collisions at sea and loss of life continue to occur, thereby underscoring the essentiality of understanding the principles so articulately explained in this new edition of *Farwell's Rules of the Nautical Road.*

Unfortunately, tragic collisions are not confined to the pages of history books. The two most recent cases in the U.S. Navy involve the destroyers USS *Fitzgerald* (DDG 62) and USS *John S. McCain* (DDG 56) in 2017. As the then-director of the Navy staff, I was charged with organizing a memorial service for the families of those sailors lost on *Fitzgerald* at the Pentagon and saw firsthand the personal emotional devastation of those who lost loved ones as well as the impact to the institution of the U.S. Navy, which I served for four decades. In a final analysis, the chief of naval operations, Admiral John M. Richardson, commented, "These accidents were preventable."[2]

As a result, the vice chief of naval operations, Admiral William F. Moran, directed the commander of the U.S. Fleet Forces Command to conduct a "comprehensive review" into the root causes of these two incidents and a variety of others and make recommendations to prevent their recurrence. In the cases of both *Fitzgerald* (DDG 62) and *John S. McCain* (DDG 56), many of the lessons learned were not new, to include misapplication or misunderstanding of the nautical rules of the road, failure to take appropriate action to avoid collision in an "extremis" situation, lack of teamwork, and equipment problems due to system failure or operator error. Since 2017, the U.S. Navy has worked diligently to resolve these root causes and make every effort to conduct self-assessments and verify compliance.

Not surprisingly, errors of omission or commission are not unique to the U.S. Navy. Immediately after the conclusion of Exercise Trident Juncture in Norway in November 2018—the largest North Atlantic Treaty Organization

(NATO) exercise since the end of the Cold War, with 70 ships, 265 aircraft, and 50,000 soldiers, sailors, airmen, and Marines representing all NATO allies—one of the Norwegian warships that had performed successfully in the exercise, the frigate HNoMS *Helge Ingstad* (F 313), suffered a collision with the tanker *Sola TS* in Norwegian waters just outside Sture Terminal. *Helge Ingstad* sustained so much damage that it later had to be scrapped. Resulting inquiries by both the Accident Investigation Board Norway and the Defence Accident Investigation Board Norway concluded that if the COLREGs had been appropriately applied, the collision could have been avoided. As with so many collisions, there were no new lessons learned.

In my experience serving on the bridge of a submarine with a low visual and radar profile, nighttime steaming requires additional vigilance from every member of the team. In three of the cases mentioned above, complications due to nighttime steaming contributed to poor decision making on the bridges of *Hobson, Fitzgerald*, and *Helge Ingstad*. Whether during the day or at night, application of the rules is the same. Yet, in two of these unfortunate cases, the commanding officers were asleep in their staterooms.

As discussed in *Farwell's Rules of the Nautical Road*, communication is paramount. COLREGs provides for both visual and audio communication schemes in terms of lights, shapes, or audible sound signals exchanged via the mechanism of the ship's whistle. As the authors point out, "It is worth noting that despite the prevalent use of the bridge-to-bridge radiotelephone today, radio communication does not feature prominently in the rules." In my experience as a ship driver, and in my night orders and shipboard training and qualification plan, I always instructed my officers of the deck to overcommunicate. There is no substitute for clearing up confusion in lighting configurations on deck or the misinterpretation of sound signals than to pick up the bridge-to-bridge radio and speak to your counterpart on the bridge of an approaching vessel.

Another factor that contributed to two of the four incidents discussed above is speed. COLREGs defines safe speed as: "Every vessel shall at all times proceed at a safe speed so that she can take proper and effective action to avoid collision and be stopped within a distance appropriate to the prevailing circumstances and conditions."[3] *Farwell's Rules of the Nautical Road* states:

> The rule articulates an objective standard, but one that might well produce different safe speeds for two vessels involved in a collision, as each applies the factors to her particular circumstances and conditions. As the circumstances or conditions change—and they almost certainly will—the vessel's speed must be reassessed in light of the changes. Vessels that practice safe passage planning will recognize that the safe speed

> rule is a key factor in passage planning and that the plan may require en route adjustments to respond to changed circumstances.

Another thing I learned as a junior officer is that speed is an important factor on the surface. In commercial shipping, time is money, and therefore the need to transit at the highest and most economical speed possible dominates the priorities of the bridge team. Sometimes, when entering port, it is a race to get to the first sea buoy.

In naval applications, speed is professionalism. No one wants to be late for a mooring when tugs, senior officers, logistics and maintenance support, and families are waiting at the pier. In my time at sea, however, I found that avoiding a narrow close point of approach or an extremis situation can be easily resolved by just slowing down and letting the problem generate. You can almost always gain ground later when the contact situation is alleviated.

The only time this practice did not work for me was when I, as officer of the deck, was navigating the complicated navigation scheme of the Kattegat, Skagerrak, and Store Belt of the Danish Straits into the Baltic Sea. I do not know of many other U.S. nuclear submarine officers who have had that experience on the surface. We had two Danish pilots onboard the submarine for a 24-hour maneuvering watch on our way into Keil, Germany, during the Cold War. As we proceeded through choke points and heavy traffic density, with numerous ferries crossing at right angles to the submarine's track, my tendency was to slow down. The frustrated, chain-smoking Danish pilot on the bridge emphatically called for more speed! But since it was my watch and my responsibility, I did what I thought was right. This resulted in several situations in which ferry boat skippers blasted their horns and maneuvered to cross close astern of the submarine or, in the worst case, across the bow. I finally woke up and realized that the Danish pilot was right; in this particular situation, there was a certain quality to maintaining speed, which equated to predictability and a safe crossing situation. Navigating the Danish Straits was like participating in a ballet on the surface of the sea flanked by the shorelines of Norway and Sweden and an archipelago of islands, rocks, and shoals to both starboard and port. Experiences like this make for a more professional mariner.

Whereas the rules of the nautical road have not changed much in the last century, our warships have become much more sophisticated in terms of the bridge-watch interface, electronic navigation, and far more advanced radar suites. There is a certain quality in simplicity, but both commercial ships and warships are becoming far more complex to operate. That said, it remains the commanding officer's responsibility to ensure that the materiel condition of

their ship is fit for purpose and ready for sea. There is no substitute for intrusive leadership in terms of readiness, particularly in the case of navigation, communication, and propulsion systems.

One of my favorite training topics in the wardroom was the examination of collision and grounding case studies and lessons learned. I constantly used the refrain "rewind the tape" when training my junior officers. In other words, think about the consequences of your action or inaction when you assume the watch. Have you examined the pre-underways to ensure that they are an accurate reflection of the materiel condition of the ship? Did you plot and evaluate the last fix yourself? Did you take soundings at the right interval? Did you test the ship's whistle? Have you read the commanding officer's night orders before assuming the watch? Have you verified that your watchstanders in your watch section are properly rested and ready to assume the watch? In the final analysis, if an untoward incident happens on your watch, your every action will be scrutinized, as in the case of the comprehensive review. Are you prepared to stand tall and assume accountability for everything that might be uncovered, including log-keeping and paperwork? The authors of *Farwell's Rules of the Nautical Road* provide many more examples in which mistakes made could have been avoided with an ounce of prevention. Just like an MBA student at Harvard Business School learns about success or failure in the financial world through case studies, the master mariner also learns through the mistakes of others.

I will conclude my review of *Farwell's Rules of the Nautical Road* by underscoring the authors' reference to the twenty-first century elephant in the room: the future of unmanned systems and safe navigation at sea. With the technology push toward unmanned bridges or entire ships, can the world's oceans remain safe? As they so aptly state:

> Fully and semi-autonomous vessels already ply the seas, albeit mostly in experimental roles for now. Yet a reality of manned and unmanned vessels interacting regularly is not difficult to foresee in the near future. The question the professional maritime community must soon address is how to reconcile the existing rules of the road with the paradigm shift created by vessels that can navigate with little or no human involvement. As written, the rules rely on human senses and decision making faculties. Can those faculties be replicated by artificial equivalents? Can the COLREGS and Inland Navigation Rules remain intact with incremental revisions, or do automation and unmanned technology pose enough of a disruptive variable to the status quo that the rules will need to be revisited

> entirely, perhaps with another international effort on par with the 1972 conference that drafted the COLREGS?

Just as it has for decades, *Farwell's Rules of the Nautical Road* proves that it will remain relevant for many more years to come. Undoubtedly the world's oceans will continue to increase in complexity, and mariners must be up to the task. The rules of the nautical road will continue to evolve. A conference to address new technological advances in AI or unmanned systems is a good idea. This, however, will require international consensus, and I am afraid that will probably not happen until we experience a catastrophic incident between a manned and unmanned vessel at sea. Until then, I would remind naval officers worldwide never to assume that the actions of an approaching vessel can be predicted with 100-percent certainty. Heed the advice of this exceptional book, proven over decades to be the authoritative guide to mariners. In all cases, apply the rules of good seamanship and the general prudential rule now more than ever.

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Admiral, U.S. Navy (Ret)

Endnotes

1. "Hobson's Choice," *Wall Street Journal*, 14 May 1952.
2. W. J. Hennigan, "Trump to Visit Pacific Military Command Embroiled in Controversy," *Los Angeles (CA) Times*, 2 November 2017.
3. 33 CFR § 83.06, Safe speed (Rule 6).

Here They Come. By Scott A. Porter. Virginia Beach, VA: Koehler Books, 2020. Pp. 298. $26.95 (hardcover); $18.95 (paperback).

> Julianna aims her pistol using both hands waving it back and forth between the three of them. None of them flinch. In Serbian, the one on the right asks who she is. She responds in Albanian, proudly stating her name and where she is from. When they do not understand her, she knows they are not Serbs from Kosovo. The men continue to stand still. Julianna's arms start to get heavy and then shake. It is a matter of time before she has muscle failure and lowers the pistol giving the soldiers time to unsling their weapons. (p. 42)

The above selection is a brief sample of one of the key protagonists in the novel *Here They Come* dealing with a life-or-death situation. Scott A. Porter has created a gripping, hard-to-put-down account that places the reader in the middle of the Kosovo conflict in the late 1990s. It is a love story wrapped in a combat operation, projected onto the backdrop of a humanitarian crisis and including ethnic cleansing. Some readers who view the conflicts in Bosnia and Kosovo in the 1990s as distant history may ask how this story is relevant to military professionals today. One answer is that we still see ethnic cleansing in today's headlines. (Sudan is a recent example.) Although fictional, *Here They Come* provides accurate descriptions of how such calamities as that which occurred in Kosovo affect individuals and groups as they struggle for survival.

The novel begins with a very real dilemma of two star-crossed lovers from Kosovo: a Serbian man named Miro and an Albanian woman named Julianna. The two grew up with one another and fell in love. As they see the looming conflict approaching, they resolve to flee the country and get married. This storyline is a golden thread throughout the book as the couple is placed in multiple life-threatening situations exacerbated by military, paramilitary, and secret police forces that are constantly battling each other, creating havoc wherever they go, and making survival itself challenging.

Here They Come describes multiple military operations from the many different players in the Kosovo conflict. The North Atlantic Treaty Organization (NATO) deploys a U.S. Special Operations Forces soldier with his military working dog, Trooper, and a British Special Air Service (SAS) operator to engage in combat advising of the Kosovo Liberation Army (KLA). Each account of this small team is filled with engaging descriptions of special operations field craft, direct action, reconnaissance and surveillance, and key leader engagement with indigenous forces. There are also some extremely engaging sections depicting targeting that ranges from the tactical through operational levels. One of the most exciting portions of the book is a nail-biting description of close air support provided by Fairchild Republic A-10 Thunderbolt II "Warthog" attack aircraft. These professional NATO special operations professionals are contrasted with Serbian conscripts serving in the Yugoslav army and their counterparts in the KLA, illustrating the stereotypical problem of indigenous forces' uneven training and experience. All these players are in a tug-of-war in Kosovo over both the terrain and the civilian populace.

The novel contains multiple descriptions of the very real perils that civilians face in conflicts like Kosovo. Internally displaced persons, both Serbian and Albanian, are depicted fleeing out of the way of opposing combatant forces. Many must dodge paramilitary forces who are bent on ethnic cleansing while simultaneously attempting to avoid the carnage of war as these forces engage each other. For military professional educators studying how military professionals

can deal with ethical dilemmas and address atrocities, all while exercising just war theory and practice, this book provides many useful case studies.

In *Here They Come*, Porter has provided military and civilian readers an opportunity to gain empathy for the plights of those in the complex environment of a conflict such as Kosovo. Readers should care about these conflicts because they continue to happen in our world today, and U.S. military professionals as well as U.S. Department of State personnel might someday find themselves dealing with one. Whether examining this context from the perspective of IDPs/refugees, special forces operators advising indigenous forces, or just two young lovers trying to survive a lethal environment, *Here They Come* is an engrossing narrative that puts the reader in the middle of the action. It starts out fast and accelerates throughout. It is a must-read for civilian leaders, military professionals, and educators alike.

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Divided Armies: Inequality & Battlefield Performance in Modern War. By Jason Lyall. Princeton, NJ: Princeton University Press, 2020. Pp. 528. $99.95 (hardcover); $35.00 (paperback).

Inequality as a Key Determinant of Battlefield Performance

In 2015, the Commandant of the Marine Corps, General Robert B. Neller, released a statement on the importance of diversity in the U.S. Marine Corps, stating, "Diversity is the aggregate of the varied cultures, backgrounds, talents, skills, and abilities among Marines. Diversity for the Marine Corps means we Marines are connected in a special relationship with the American public; we are leveraging America's varied pool of skills and abilities; and we are maximizing individual differences as a force multiplier."[1] In Dr. Jason Lyall's new book, *Divided Armies: Inequality & Battlefield Performance in Modern War*, the author examines the value of diversity in military forces and discusses the benefits and consequences of diversity as well as its importance to military success. The theory behind Lyall's ideas seems apparent: that greater diversity and equality within the military leads to better battlefield results. That said, there is much more than meets the eye that is hidden within this theory.

Lyall first defines key terms to lay the foundation for his theory. Vital to

understanding how effective an army is in battle depends on the definition one uses for battlefield performance. Lyall states that battlefield performance is "the degree to which a state's armed forces can generate and apply coercive violence against enemy forces in direct battle" (p. 9). Key terms to tease out of this definition include *cohesion* and *combat power*, both of which are needed to inflict violence on the enemy effectively. Both are required to achieve great battlefield performance, and they are central to the idea of equality being vital to battlefield success.

Using the definition above, as well as comparisons to the three normative facets of what comprises victorious armies—power, ideations, and institutions—Lyall introduces the main idea missing from these conventional ideas on war: the human factor.

Modern armies are nothing like what is depicted in movies and television shows such as *Game of Thrones*. Men and women in battle are not unphased, obedient robots trained to strike when ordered. Instead, modern militaries are made up of sentient soldiers who possess the same qualities, quirks, and idiosyncrasies as anyone else. Further, the three tenets that comprise successful armies ignore soldiers' racial and ethnic identities. Consequently, the common ideas used to define a successful army ignore the role that inequality plays in an army's victory or defeat. Tied together with the definition outlined of battlefield prominence, Lyall connects the dots between inequality in the military and the negative battlefield performance of an army.

The key idea that is sussed out from the beginning of this book is that inequality plays a large role in modern armies' battlefield performance. When one group of soldiers is discriminated against, or when one group feels unrepresented within the larger army, that army is more likely to suffer on the battlefield. This idea gives new credence to the push for greater diversity within the military. The inclusion of different beliefs and life experiences adds to the striking power of a force, and when a larger part of a nation is represented on the battlefield, and all soldiers are treated equally, the force fights better and wins more.

Project Mars

In *Divided Armies*, Lyall defines inequality as "the uneven distribution of membership within a given political community across the groups that find themselves nestled within the boundaries of the same territorial unit, whether a state, empire, or other form of political organization" (p. 4). To help quantify his theory of the importance of equality in battlefield performance, Lyall created Project Mars, a "new dataset of 250 conventional wars fought by 229 belligerents between 1800 and 2011" (p. 17). Using Project Mars, Lyall is able to illustrate the likelihood of four kinds of battlefield outcomes given greater military inequality. The four behaviors are 1) the probability of loss, 2) mass desertion, 3)

mass defection, and 4) the deployment of blocking detachments used to coerce soldiers to fight through the threat of fratricidal violence (p. 17).

Until now, no readily available measure of inequality within an army has existed. Consequently, Lyall created a military inequality coefficient (MIC), which calculates an army's level of inequality across its constituent ethnic groups (p. 7). A MIC consists of two components: the relative share that each ethnic group represents among an army's prewar personnel and the numeric value assigned to each ethnic group based on its position within the political community. From here, Lyall is able to depict the results of what has happened to an army plagued by inequality.

The results are eye-opening. An army plagued by inequality has a 75 percent greater chance of sustaining higher casualties than the enemy than does an army with greater equality among its ranks. Mass desertion, a rarity in equal and diverse armies, is extremely likely in an army with great inequality. The same goes for mass defection and the probability of using blocking detachments. The graphs displayed in the book clarify that the greater the inequality of an army, fueled by a lack of diversity of a nations' soldiers, the worse its battlefield performance (p. 18).

Lyall spends five chapters highlighting historical examples that support his theory. Inequality attacks the morale of soldiers in minority or discriminated groups, lowers trust among ethnic groups in the unit, and divides groups of soldiers into factions that are more likely to defect in concert with one another (pp. 19–22). Through his employment of Project Mars, as well as the many in-depth examples that are discussed and analyzed in his book, Lyall proves that inequality significantly affects the battlefield performance and success of an army.

The Future of War

One of the most fascinating concepts in *Divided Armies* focuses on the future of warfare and how inequality in modern militaries will continue to have a severe and deleterious effect on battlefield performance in 2021 and beyond. The key question posed by Lyall is whether any or all the potential problems that can result from inequality within an army—including mass casualties, desertion, mass defection, and the use of blocking detachments—will remain an issue as warfare become less human-focused and more robot- and cyber-oriented. He concludes that, yes, inequality will remain an issue in modern militaries. From the exploitation of fissures in society caused by identity politics to near-peer threats on the world stage, the human factor of war will forever be a critical factor in the success of any military. In the future, the fissures lying hidden in every society may be targeted to create instability in a nation's armed forces. These acts of war may come in the form of propaganda from enemies abroad, aiming to increase desertion and defection among a nation's military members

and hoping to stifle its ability to attack in full strength. In reading *Divided Armies*, one realizes how strategically significant diversity and equality can be for mission success.

Conclusion

Divided Armies offers a fascinating look at an idea that gets lost in the American political conversation as little more than a politically correct maneuver used by employers and now the U.S. military. Instead, what is gleaned from this book is that diversity and equality are every bit as crucial to battlefield success as any other facet previously thought to be vital to the success of an army. Lyall lays out an intelligible thesis that is novel and apropos in the world today. As the U.S. military becomes more diverse, hoping to use the strengths that the nation's population holds, it must be cognizant that equality among these diverse groups of individuals is crucial to winning the next war. Along with General Neller's sentiments on increasing diversity to take full advantage of America's "pool of skills and abilities," diversity and equality should also be sought to improve battlefield performance. As the twenty-first century progresses and near-peer threats create sophisticated maneuvers to target instability in the United States, maintaining diverse, equal, and cohesive military units is just as important to battlefield success as any other factor.

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Endnote

1. Gen Robert E. Neller, "Commandant of the Marine Corps Diversity Policy," 2018.

Containment in the Middle East. By Ehud Eilam. Lincoln: Potomac Books, an imprint of University of Nebraska Press, 2019. Pp. 216. $29.95 (hardcover and ebook).

Containment in the Middle East offers a survey of various efforts to politically and militarily contain a wide range of factions and interests of various Middle Eastern countries. The book refrains from prescribing a specific approach or policy and is more a narration of events that have taken place in recent years, chiefly between 2011 and 2019. The book is modestly engaging and notable for its broad scope, but it lacks sufficient depth to garner much support from military historians, researchers, or policy makers.

Containment is not an easy topic to write on, and when it comes to the Middle East, it is made even more difficult since there are so many sides and often each individual state is facing multiple threats on multiple fronts. U.S. containment policy during the Cold War era is perhaps more easily described and better understood since both politically and geographically, to a large extent, the sides were on linear lines opposed to each other. However, this book makes it clear that attempts at containment in the Middle East are far more difficult given the need to face so many different containment directions and contain so many oppositional forces.

Author Ehud Eilam provides a very broad survey of various methods of containment and presents in clear terms the difficulty of practicing containment in a region where alliances and objectives can be transitory, contradictory, and fragile. A good example of this is Israel's attempt to contain Hezbollah, Hamas, Fatah, Egypt, and Iran. All of these are equally important, yet they bring with them conflicts of interest and objectives that are almost mutually exclusive. As the book's main time frame spans from March 2011 to the beginning of 2019, the material therein is very fresh and almost unsettled. Changes that are coming in the next few months will add some fresh layers to the subject. The Joint Comprehensive Plan of Action (JCPOA, also known as the Iran nuclear deal) features broadly throughout the text, toward which the author takes a favorable approach. (He has disagreed with the U.S. withdrawal from the agreement under President Donald J. Trump in 2018; there is more authorial alignment between his writing and the policies of President Barack H. Obama's administration.)

There is sudden awareness of both the broad survey nature of the book and that there is no specific thesis other than the title topic or policy initiative being advocated. The author covers containment from a wide perspective and does not drill down into the minutia of any specific country's policies in one specific direction or effort. The survey includes nations such as Israel, Egypt, Syria, and Jordan, as well as groups such as Hamas, Hezbollah, Fatah, and the Palestinian National Authority. This both enhances the book and proves to be a hindrance. For general readers and nonspecialists, this book serves as a good introduction to the various issues involved and general history behind containment. The more recent time frame contextualizes daily headlines and provides a more linear definition to what is taking place in the Middle East.

For readers who are policy makers or involved in international relations, Middle East studies, or other related topics—essentially those who are interested in developing more concise understandings of recent events—there will be disappointment. The author recaps much of what has appeared in the headlines and refrains from offering deeper source analysis or investigation that could be helpful within their own particular area of interest. A few policy documents are

discussed, particularly with regard to Israel, but they are never dwelt on to the depth that will satisfy many readers. A look through the endnotes (the book does not contain a separate bibliography) demonstrates some reasons for this. Only a few books that have been consulted, while the vast majority of sources referenced are news articles pulled from various online platforms. Haaretz, the *Jerusalem Post*, CNN, the *New York Times*, the *New York Post*, and Al Jazeera are the leading sources; additional sources occur only once or a handful of times. This is a drawback, since newspaper articles are not always accurate at the time of publication and can later be corrected or removed. Only long-term reporting can create a systematic and reliable narrative foundation. Other sources include online articles from the Middle East and various policy think tanks based in Washington, DC, or other parts of the world. Of the books that have been consulted, none delve into containment strategy or other topics that would normally be associated with the larger subject of how effective containment may take place and what constitutes a successful containment strategy. Another drawback is that some of the information in the book is repetitive and can be found in more than one chapter. Readers will feel anxious to skip those sections that have been discussed elsewhere in the book. The book itself is short; if the reader is not overly burdened with commitments, they should be able to finish it in just a few days.

The biggest problem with *Containment in the Middle East* is the writing, which reflects the level of English that the author has achieved. Eilam is not a native English speaker or writer, and that becomes very obvious from the outset of the book. There are numerous grammatical and basic sentence structure errors, which hinders and complicates understanding. Though there may well be much more in this book, it has unfortunately been obscured by the lack of clarity. It would have been beneficial for the author to have passed this manuscript to a native or longer-term English speaker and writer for further clarification and editing. Some errors include, but are not limited to, instances such as "the Hezbollah" or "the Hamas," when only "Hezbollah" and "Hamas" are appropriate. These grammatical issues persist until the last quarter of the book, which this reviewer suspects was more carefully proofread and written than the first three quarters. This reduces the book's value to a large portion of its audience, and it may only be read all the way through by those who are committed to the text.

This book is not recommended for policy makers, military leaders, and research scholars, due to its lack of deep analytical development and a heavy reliance on news sources rather than the works of established scholars in the field. While not an analytical source, it works effectively as a reference volume for those whose specialty is in this area. The book can perhaps be best applied as a freshman-year introductory work that can be a part of a larger required

reading corpus and consequently introduce students of international relations and other related fields to the subject, but this reviewer does not recommend it as a senior- or graduate-level reading requirement.

James Bowden, MA
Independent Scholar

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