

“Getting the Shells to Fall Where You Want Them”

COORDINATING U.S. NAVAL GUNFIRE AND AIR SUPPORT IN THE INTERWAR PERIOD¹

by Chris K. Hemler

Abstract: During the years of peace between the First and Second World Wars, it is clear that Navy and Marine Corps planners failed to sufficiently address several problems that would confront American forces in the looming conflict with Japan. Of these, one of the greatest omissions concerned the application of naval and aerial fires in support of an amphibious landing. Though American officers recognized and resolved concerns over landing craft, logistics, casualty evacuation procedures, communications, and much more, planners failed to adequately address the difficulties of controlling and coordinating supporting firepower in a triphibious operation. The 1934 *Tentative Manual for Landing Operations* highlighted the individual roles of naval gunfire and air support without confronting the more general coordination of land, sea, and air efforts, and it minimized the importance of flexibility and continuous coverage in amphibious fire support.

Keywords: triphibious operations, amphibious landings, amphibious fire support, naval gunfire support, aerial support, coordination of firepower, interwar period, *Tentative Manual for Landing Operations*

Traditional accounts maintain that the U.S. Marine Corps deserves near-unqualified praise for its pioneering work in amphibious warfare during the years of peace between the First and Second World Wars. Though some challenges remained—these authors reason—the Marines had resolved every predictable hurdle of the amphibious assault. Led by visionaries such as George Barnett, Earl H. Ellis, John A. Lejeune, and John H. Russell, the

a reliable doctrine. In these widely accepted interpretations, the implication is that the fighting itself was the only problem yet unsolved in the approaching war with Japan.²

Despite this rousing narrative, it is clear that Navy and Marine Corps planners failed to sufficiently address several problems that would confront American forces in the looming conflict with Japan. Of these,

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<https://doi.org/10.25218/mch.2020060101>

¹ Charles Barrett, “Correspondence: Major C. D. Barrett to CDR H. A. Flannigan,” 15 October 1931, Historical Amphibious File (HAF) 70, COLL/3634, Marine Corps History Division (MCHD), Quantico, VA, 3.

² For representative interpretations, see Richard Wheeler, “Prologue: The Corps Finds a Mission,” in *A Special Valor: The U.S. Marines and the Pacific War* (Annapolis, MD: Naval Institute Press, 2006), 1–3; LtGen Victor H. Krulak, *First to Fight: An Inside View of the U.S. Marine Corps* (Annapolis, MD: Naval Institute Press, 1984), 71–87; Dirk Anthony Balleendorf and Merrill Lewis Bartlett, *Pete Ellis: An Amphibious Warfare Prophet, 1880–1923* (Annapolis, MD: Naval Institute Press, 1997), 159–62; and David J. Ulbrich, *Preparing for Victory: Thomas Holcomb and the Making of the Modern Marine Corps, 1936–1943* (Annapolis, MD: Naval Institute Press, 2011), 43–70.

one of the greatest omissions concerned the application of naval and aerial fires in support of an amphibious landing.³ Though American officers recognized and resolved concerns about landing craft, logistics, casualty evacuation procedures, communications, and much more, planners failed to adequately address the difficulties of controlling and coordinating supporting firepower in a triphibious operation.⁴

A Task Too Tall: The Amphibious Assault in the Early Twentieth Century

In the nineteenth and early twentieth centuries, conventional military wisdom ruled that assaulting an enemy-held shore was an irrational, impractical, and even idiotic proposition. Contemporary technology seemed to grant almost every advantage to the defender. Inherently, land-based guns benefitted from a more stable firing platform, larger shells, and more reliable targeting methods. These characteristics promised increased range, improved accuracy, and more destructive power over shipboard ordnance. To seize a defended shore—in the face of machine guns, entrenched artillery, and preregistered mortars—amphibious troops would need to overcome marked disadvantages. For the attentive student, the task seemed all but impossible. As British admiral John Arbuthnot Fisher put it during the First World War, “Any naval officer who engages a fort worthy of the name deserves to be shot.”⁵

Indeed, the Allied disaster at the Dardanelles in 1915 seemed to confirm the death of the amphibious assault as a sensible military operation.⁶ In their attempt to land on the Gallipoli peninsula and expel the Ottoman Empire from the First World War, British

and French forces met stunning failure. At its heart, the operation suffered from poorly trained, under-equipped troops unprepared for the challenge of their assignment. But these Allied shortcomings were multiplied by several tactical errors of the highest degree. Several units landed on the wrong beaches, touching down on territory that did not even appear on their maps. In the opening moments, British and French commanders acted with indecision and failed to mount any momentum along the tenuous beachhead. Air support, naval gunfire, and artillery all proved insufficient. Amidst the chaos, Ottoman counterattacks stole any semblance of initiative from the floundering assault. By January 1916, Allied forces had abandoned the landing and retreated from the theater.⁷

In the aftermath of the bungled Gallipoli attack, military officers and advisors alike had renewed reason to retire the amphibious assault. For most military theorists of the day, the mere “name Gallipoli [became] synonymous with incompetence and failure.”⁸ Even the chief of staff of the Royal Navy squadron during the Dardanelles operation, Commodore Roger J. B. Keyes, declared that “[one of] the most valuable lessons we learnt from the original landings was the folly of attempting to storm a defended beach in daylight.”⁹ The twentieth-century amphibious assault, it seemed, was suited for few but a martial madman.

Such deep-seated doubts over offensive landing operations were hardly unique to British officers of the day. Skepticism ran deep in the U.S. Army as well, where officers were quick to point out the inherent advantages of the defender. In a focused piece on coastal defense procedures, Major General William G. Haan summarized the attacker’s precarious situation: “An enemy landing from boats on an open beach will consist largely of infantry without transportation, with limited ammunition and with no artillery except

³ See Craig C. Felker, *Testing American Sea Power: U.S. Navy Strategic Exercises, 1923–1940* (College Station: Texas A&M University Press, 2007), 88–109; and Allan R. Millett, *Semper Fidelis: The History of the United States Marine Corps*, rev. ed. (New York: Free Press, 1991), 332–33.

⁴ *Triphibious* refers to concurrent land, sea, and air actions.

⁵ As quoted in Arthur J. Marder, *The Anatomy of British Sea Power: A History of British Naval Policy in the Pre-Dreadnought Era, 1880–1905* (New York: Alfred A. Knopf, 1940), 495.

⁶ Gunther E. Rothenberg, “From Gallipoli to Guadalcanal,” in *Assault from the Sea: Essays on the History of Amphibious Warfare*, ed. LtCol Merrill L. Bartlett (Annapolis, MD: Naval Institute Press, 1983), 177–82.

⁷ Rothenberg, “From Gallipoli to Guadalcanal,” 177; Jeter A. Isely and Dr. Philip A. Crowl, *The U.S. Marines and Amphibious War: Its Theory, and Its Practice in the Pacific* (Princeton, NJ: Princeton University Press, 1951), 17–21.

⁸ Theodore L. Gatchel, *At the Water’s Edge: Defending against the Modern Amphibious Assault* (Annapolis, MD: Naval Institute Press, 2011), 10.

⁹ Roger Keyes, *Amphibious Warfare and Combined Operations* (New York: Cambridge University Press, 1943), 53.

the smallest portable guns.”¹⁰ In Haan’s mind, the outcome was predetermined: the inadequate firepower of the landing force would be no match for a mobile defense with artillery, obstacles, and modern machine guns at its disposal. In nearly every consideration, the amphibious assault was an onerous—perhaps even futile—endeavor.

Against this stern and well-founded resistance, however, the U.S. Marine Corps began to think intentionally about the complexities, challenges, and potential solutions of the modern amphibious assault. Alerted by Japan’s growing ambitions in the Pacific and already serving the twentieth-century Navy as an

advanced base force, the Corps embarked on an energized search for purpose. Hopeful that the amphibious mission would bolster and confirm the Corps’ contribution within the American armed forces, several key leaders redirected the Service’s attention and embarked on a tumultuous transformation of the Marines’ capabilities, structure, and commission. The decades ahead promised change for the Corps, but few could have predicted just how fundamental, and ultimately decisive, that change would be.

Setting a New Course: The Marines as Amphibious Pioneers

The Marine Corps had emerged from the First World War with newfound credibility, combat experience, and, most importantly, public support. Throughout their service in General John J. Pershing’s American Expeditionary Forces—and most notably at Belleau Wood—the Marines displayed remarkable courage,

¹⁰ “Joint Army and Navy Action in Coast Defense: Part III, A Positive System of Coast Defense (Army),” *Journal of United States Artillery* 53 (December 1920): 569. Historian Brian Linn labels Haan one of the foremost military thinkers of the post-World War I period. See Brian McAllister Linn, *The Echo of Battle: The Army’s Way of War* (Cambridge, MA: Harvard University Press, 2007), 125–26.



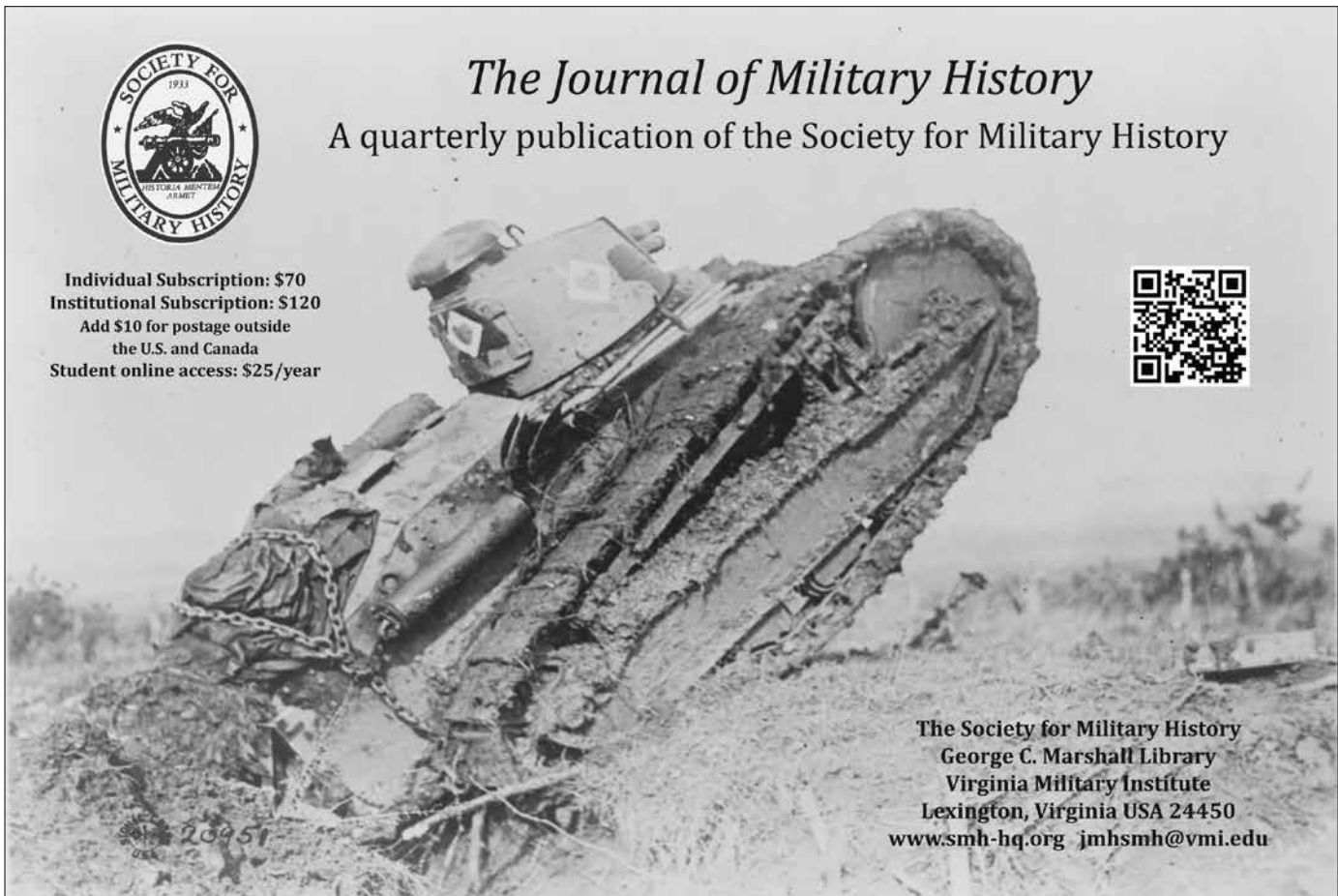
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grit, and resiliency. Enjoying more autonomy and higher-quality recruits because of their Service's relatively small size, the Marines used their wartime exploits to nurture their identity as an elite, specialized force. A dash of embellishment on top—aided by the complicity of the American press corps—solidified the Marines' image all the more. Even before the belligerent nations made their peace at Versailles, France, in 1919, the Marine Corps had bolstered its reputation as a distinct and unparalleled American fighting force.¹¹ Yet, even in light of a reinforced image, Marines and outsiders alike continued to disagree about the Corps' proper role in the American military apparatus. Should the Corps continue a trend of expeditionary service, act as a colonial police force, or reassert its naval roots and purpose?¹² Though the Service had strengthened its standing, the First World War further compromised the existential purpose of the Marine Corps.

In the shadow of the First World War, then, the Marines returned much of their focus to their prewar function as an advanced base force of the U.S. Navy. Under this vision, which found both its roots and its strength in the ideas of the indomitable naval theorist Alfred Thayer Mahan, the Marines were to act as a maritime force capable of securing and defending overseas bases that would, in turn, sustain American warships anywhere in the world. By seizing an expanding web of coaling stations for the U.S. fleet, the Marine Corps would play a fundamental role in any future naval conflict.

Despite an obvious amphibious connection with the Marines' future operations in World War II, this early concept of advanced base operations differed in one basic element: it was a reactive, defensive force rather than a robust team built for offensive landing operations. Based on the early model, the Marines were to seize vacant territory and fortify it for battle. At most, they anticipated nominal resistance. More likely, the Marines expected to land ashore and simply

claim the bases as their own. As two notable Marine historians revealed, "in practice all of the training concentrated on the defense. . . . The advance-base force was in actuality little more than an embryo coastal artillery unit."¹³

Two Marines in particular deserve credit for gradually shifting the Corps' attention from the defense of unoccupied shores to the rapid, offensive seizure of strengthened enemy posts. The first, Lieutenant General John A. Lejeune, became Marine Commandant in 1920 and set the Service on a progressive but patient path toward aggressive amphibious operations. Unsettled by growing Japanese aggression in the Pacific and alarmed by the significant territorial concessions made to the Japanese at Versailles, Lejeune connected American security in the Pacific with the United States' ability to launch offensive landing operations across the region. Pursuing his vision for a modern Marine Corps, Lejeune slowly refined and buttressed the Corps' purpose in light of contemporary security concerns.¹⁴

Lejeune was hardly the first to acknowledge the growing rift in the Pacific. Indeed, by the early 1920s, the Navy Department identified Japan as its most likely future enemy and began deliberate preparations for the looming contest. The Americans' resultant plan—famously labeled War Plan Orange—went through a series of revisions in the succeeding decades, each of which centered on defending the Philippines and leading a prolonged naval campaign to capture Japanese bases across the Pacific. Here, Lejeune's shift toward offensive amphibious operations neatly paralleled (indeed, reflected) the Navy's intention to turn back Japanese expansion. War with Japan would compel a succession of amphibious assaults across the Central and Western Pacific. Lejeune, and Marine leaders who followed, were determined to position the Marine Corps for that exact task. Of course, shifting the Marines' focus to offensive landing operations not only helped solve the operational problems of a future Pa-

¹¹ Millett, *Semper Fidelis*, 303–18.

¹² Robert Debs Heintz Jr., *Soldiers of the Sea: The United States Marine Corps, 1775–1962* (Baltimore, MD: Nautical and Aviation Publishing Company of America, 1991), 231–32.

¹³ Isely and Crowl, *The U.S. Marines and Amphibious War*, 23–24.

¹⁴ Millett, *Semper Fidelis*, 322–25.

cific War, it also delivered an existential purpose for the post-World War I Corps.

To study the growing problem in the Pacific with more focus, Lejeune appointed a brilliant young staff officer by the name of Lieutenant Colonel Earl H. Ellis. Though Ellis was known as a heavy drinker with a fiery temper, he also carried an equally established reputation as one of the Corps' most talented strategic thinkers. Even for the disciplined and professional Lejeune, Ellis's aptitude as a Marine officer far outweighed his dangerous penchant for stiff drink. As commanding general of the 2d Marine Division during the First World War, a subordinate once alerted Lejeune that Ellis appeared "indisposed" because of his usual habits and might therefore be unsuited for his battlefield duties as adjutant. In reply, Lejeune snapped that "Ellis drunk is better than anyone else around here sober."¹⁵

Having established a personal rapport with Lejeune, Ellis emerged from World War I ready to tackle the general's next great task: that of confronting the Japanese in the Pacific. Alongside the Navy Department's broader development of War Plan Orange, Ellis quickly acknowledged the disturbing but unavoidable work that awaited the Corps. To win a contest in the Pacific, the Marines would have to prepare for a succession of concentrated amphibious assaults. As the prescient Ellis well knew, such attacks would be met by fierce and organized Japanese resistance from hardened island positions. In words that would become prophecy, Ellis declared: "The landing will entirely succeed or fail practically on the beach."¹⁶

Fatefully, Ellis would not live to see the theoretical battles that he studied with such vigor and diligence. In 1923, he died mysteriously on Palau Island while on a self-appointed reconnaissance mission to study existing Japanese defenses.¹⁷ Nonetheless, his capstone research, eventually christened "Operation

Plan 712: Advanced Base Operations in Micronesia," formed the Corps' interwar foundation of amphibious strategy and doctrine. In part, Ellis's pioneering work helped advance the rising stature and expectations of the Marines. By 1927, a Navy Department directive specifically assigned amphibious landing operations to the Marine Corps, and in 1933, Navy *General Order 241* reorganized the Corps as a Fleet Marine Force. Through these bold bureaucratic moves—and in large part thanks to the energetic leadership and vision of Lejeune and Ellis—the Service found itself explicitly assigned and structured for its budding amphibious mission.¹⁸

Painful Fits and Starts: Early Amphibious Exercises and Doctrinal Progress

Administrative change was one thing, but if the Marines were to embrace and develop their nascent mission, they would need practical, hands-on experience. In 1922—just months after Ellis completed his landmark research—the Corps formed a provisional battalion and dispatched it to Guantánamo Bay, Cuba, and Culebra, Puerto Rico, for a series of landing exercises. The following year, a detachment of Marines practiced amphibious landings at Cape Cod, Massachusetts. By early 1924, the Marine Corps had solicited participation from the Navy's Atlantic Fleet and several nearby Army contingents for a further sequence of exercises at Culebra.

These early amphibious maneuvers—or Fleet Problems as they were called—presented the Marines with a number of obvious challenges, perhaps too many to address at once. The 1924 operations at Culebra revealed embarkation difficulties, poor timeline coordination across the force, inefficient loading procedures, and inadequate transport shipping (both in number and in quality). The most pressing concern exposed in the Caribbean maneuvers, however, con-

¹⁵ Quoted in Ballendorf and Bartlett, *Pete Ellis*, 5.

¹⁶ LtCol Earl H. Ellis, "Advanced Base Operations in Micronesia," *Operation Plan 712*, HAF 165, COLL/3634, MCHD, Quantico, VA, 28.

¹⁷ Though the circumstances remained mysterious for decades, recent evidence shows that Ellis drank himself to death, allowing his personal vice to get the best of him. Ballendorf and Bartlett, *Pete Ellis*, 140–41.

¹⁸ Isely and Crowl, *The U.S. Marines and Amphibious War*, 24–26, 33–35; and LtCol Frank O. Hough, Maj Verle E. Ludwig, and Henry I. Shaw Jr., *Pearl Harbor to Guadalcanal: History of U.S. Marine Corps Operations in World War II*, vol. 1 (Washington, DC: Historical Branch, G-3 Division, Headquarters Marine Corps, 1958), 11–14.

cerned the Navy Department's landing craft. Navy and Marine officers alike found the attack craft too few in quantity and generally unsuited for the task. Although the inadequacy of the boats appeared at this early stage of the interwar period, it would take years before the Corps settled on a permanent model.¹⁹

After their Caribbean ventures, the Marines completed one final landing exercise on the island of Oahu, Hawaii, in the spring of 1925 before tabling their practical amphibious training for more than five years. Sidelined by events abroad, Marine expeditionary service in China and Nicaragua siphoned both valuable troops and senior leaders' attention from the amphibious mission. Accordingly, not until the mid-1930s would the Service resume its practical landing exercises and refocus its full attention on the seizure of enemy-held islands.

To their credit, senior Marine leaders quickly reasserted the Marines' amphibious role in the aftermath of the Chinese and Nicaraguan expeditions. Under Commandant Ben H. Fuller and Assistant Commandant John H. Russell, the Corps set out to develop the requisite doctrine for the task in front of it; indeed, as the years passed, conflict in the Pacific seemed only more likely. Beginning in 1931, Fuller and Russell took increasing advantage of the resident faculty, staff, and students at the Marine Corps Schools in Quantico, Virginia, and assigned them to study amphibious landing operations. By November 1933, Fuller had ordered that Quantico discontinue all ongoing classes, form specialized committees to study particular aspects of the task, and otherwise dedicate complete focus to the creation of a suitable manual.²⁰

The resulting doctrine, codified as the *Tentative Manual for Landing Operations* in 1934, became the Marines' interwar roadmap. In the words of historians Jeter Isely and Philip Crowl, the manual represented "pioneer work of the most daring and imaginative

sort."²¹ The study, later adopted and rebranded as the Navy's *Fleet Training Publication 167*, addressed command relationships, transportation, logistics, and preparatory training as it related to offensive landing operations. Spurred by visionary leaders such as Lejeune, Ellis, Fuller, and Russell, the impromptu committees tackled their commission with vigor and, within a few years, provided a firm theoretical foundation for the Corps' future niche.²²

On top of its more general guidance, the *Tentative Manual for Landing Operations* acknowledged the essential roles of naval gunfire and air support during offensive landing operations. Lacking artillery in the opening minutes (perhaps even hours) of the assault, the landing force was compelled to rely on alternative forms of supporting firepower. As the manual flatly stated: "A landing operation against opposition is, in effect, an assault on [a] defensive position modified by substituting initially ships' gunfire for that of light, medium, and heavy field artillery, and frequently, carrier-based aviation for land-based air units until the latter can be operated from shore."²³

Though the manual recognized the significance of sea-based fire support in an amphibious operation, naval gunfire presented a number of practical challenges for American forces at the time. First and foremost, naval guns were designed for combat at sea. Cannons fired along low, relatively flat trajectories that maximized their nautical range. But, when firing in support of a landing, this flat shell path meant that even a minor gunnery error could endanger the friendly landing force as it floated and then fought its way ashore. Similarly, contemporary naval guns used armor-piercing shells with a heavy outer casing designed to penetrate the skin of enemy ships before the shell's delayed fuse initiated the explosion. Yet, this characteristic also failed to translate with comparable effect. When fired against beach targets, the armor-piercing shell buried itself in the sand before

¹⁹ Felker, *Testing American Sea Power*, 94–100; and Heinl, *Soldiers of the Sea*, 258–59. For an inside look at the Marines' interwar development of landing craft, see Krulak, "Chapter 5: Ideas but No Boats," in *First to Fight*, 88–99.

²⁰ Heinl, *Soldiers of the Sea*, 299–301; Millett, *Semper Fidelis*, 329–31; and Isely and Crowl, *The U.S. Marines and Amphibious War*, 35–36.

²¹ Isely and Crowl, *The U.S. Marines and Amphibious War*, 36.

²² Millett, *Semper Fidelis*, 322–43; and Isely and Crowl, *The U.S. Marines and Amphibious War*, 34–44.

²³ *Tentative Manual for Landing Operations*, 1934, HAF 39, COLL/3634, MCHD, Quantico, VA, paragraph 1-34.

detonating, thus reducing both its destructive range and power.²⁴ Trajectories and shell design, however, were not the only limitations of interwar naval gunfire support. While the landed artillery crew fired from a stable position, sailors at sea fired from a moving platform amid rolling waves and threatening swells. Although artillery ashore operated in close proximity to the infantry units they supported, especially in the condensed beachhead of an amphibious assault, ships at sea fought from dedicated firing stations, typically between 6 and 11 miles offshore. At such dislocated distances, the ships depended on remote observers—either ashore or airborne—to assist in targeting, record effects, and make spotting adjustments during battle. To add even more complexity, ships steamed at speeds approaching if not exceeding 20 knots while they maneuvered and perhaps even evaded enemy threats within the coordinates of their assigned firing station. Inherently, radio communications became more difficult across sand, surf, and sea. In short, projecting a single, accurately placed naval shell on a land target under the chaotic circumstances of amphibious combat was no simple task.²⁵

If controlling naval gunfire was difficult, coordinating it within the broader efforts of an American task force was a formidable chore during the interwar period. Yet, alongside a Navy culture committed to conventional surface operations and the emergence of the aircraft carrier, the challenge of cross-community coordination became all the more acute. Perhaps for this reason, the *Tentative Manual for Landing Operations* focused on the distinct and independent execution of naval gunfire, and the Marines' treatise largely neglected the indispensable coordination of firepower.²⁶ Although the manual devoted 28 pages to the "Em-

ployment of Naval Supporting Groups" in amphibious operations, not even 1 full page went to the section on "coordination of ships' gunfire."²⁷ Instead, most of the chapter's ink went to the organization of the naval task force, the positioning of the vessels, and the most effective fuse-shell combinations for targets ashore. As the Navy and Marine Corps were destined to learn in the future bouts in the Pacific, amphibious assaults required close and committed cooperation. Even one component out of tune with the larger scheme could spell disaster for the entire endeavor.

The *Tentative Manual for Landing Operations* also addressed aerial support with unfettered confidence but offered little on how to integrate and synchronize aircraft within the larger scheme of the battle. While assigning pilots tasks such as reconnaissance and close support of the landing force, the authors of the manual failed to adequately address coordination between sea-based and aerial fires. The treatise discussed aerial spotting—by then an established mission for aviators—but did not delve into the intricacies of air-ground coordination or communication.²⁸ In these ways, the 1934 manual continued to highlight the individual roles of naval gunfire and air support without confronting the more general coordination of land, sea, and air efforts.

While dedicating scant attention to aerial coordination, the *Tentative Manual for Landing Operations* also minimized the importance of flexibility and continuous coverage in amphibious fire support. Here, the authors valued centralization over responsiveness, dictating that fire support should be "carefully regulated by a firing schedule" rather than remain sensitive to the actual progress of the landing force.²⁹ Instead of demanding a continuous umbrella of firepower to protect and enable the attacking infantrymen, the manual accepted that "the time gap between the lift of beach fire of offshore supporting ships and the landing of the first assault wave is inherently large."³⁰ By conceding a significant hiatus in fire support just as

²⁴ Lt Walter C. Ansel, USN, "Naval Gun Fire in Support of a Landing," *Marine Corps Gazette* 17, no. 1 (May 1932): 25–26.

²⁵ *Tentative Manual for Landing Operations*, "Chapter II: Employment of Naval Supporting Groups," paragraphs 2-300–2-325; Maj R. D. Heintz Jr., "Naval Gunfire Support in Landings," *Marine Corps Gazette* 29, no. 9 (September 1945): 40–43; and Isely and Crowl, *The U.S. Marines and Amphibious Warfare*, 38–39, 50.

²⁶ On the Navy's interwar dismissal of naval gunfire and amphibious operations—what the author terms "a strategic afterthought"—see Felker, *Testing American Sea Power*, 88–109.

²⁷ *Tentative Manual for Landing Operations*, paragraph 2-318.

²⁸ *Tentative Manual for Landing Operations*, paragraphs 2-415–2-428.

²⁹ *Tentative Manual for Landing Operations*, paragraph 2-318.

³⁰ *Tentative Manual for Landing Operations*, paragraph 2-318.

the landing force approached the beach and choosing centralization over flexibility, the Marines' pre-war theory failed to deal with the dynamic conditions of an amphibious assault. Such formulaic firepower would hardly be enough to put a landing force ashore.

The manual's noticeable omissions concerning naval gunfire may perplex the present-day observer, but they appear representative of broader Marine distrust in naval gunfire at the time. Just as now-Commandant Russel had arranged the initial development of the *Tentative Manual for Landing Operations* in 1931, the Marine Corps chartered a special board of three Marine officers in Quantico to investigate the capabilities and limitations of naval gunfire in support of amphibious operations. The committee's eventual report, *Naval Gunfire in Support of Landings*, though nominally confident, revealed more skepticism and cause for concern than the final version of the *Tentative Manual for Landing Operations* admitted several years later.

Although the committee displayed apparent confidence in its opening and concluding remarks, after closer inspection, the details of the report exposed several alarming issues. Rather prophetically, the report recognized one of the great unknowns that would plague the Navy and Marine Corps in the opening battles of the Pacific more than a decade later: the amount of naval gunfire support required to aid an amphibious assault. As the committee concluded on this matter, naval artillery could do the job, but it was difficult "to state in general terms what constitutes adequate artillery support, that is, the number of guns required to successfully attack on a given front."³¹ Devoid of practical experience, few Navy or Marine officers had even a notion of how many naval guns were adequate and—more importantly—how many naval guns were inadequate when supporting a landing operation.

If uncertain about the exact number of naval vessels and guns required to send the landing force ashore,

the 1931 Quantico board did recognize the importance of continuous fire support as the Marines approached the beach. Unlike the Corps' later manual, the special board discussed the dilemma between firepower coverage and the Marines' arrival on the beach with transparency and candor. If the assault was to succeed, the committee reasoned, the task force must "reduce to a minimum the interval between the lifting of the artillery fire from the hostile position and the arrival of the attacking infantry in that position."³² But although they acknowledged what the *Tentative Manual for Landing Operations* later omitted, the board members still stopped short of proposing a solution to the intractable issue: just how were Navy and Marine units to choreograph this delicate balance between effective fire support and the very safety of the troops making their way ashore? Whether the members of the 1931 committee were discouraged or simply uncertain how to address such coordination, they seemed satisfied to have recognized the problem without rectifying it.

Despite these underlying concerns, the general conclusions and recommendations of the board displayed steadfast confidence, just as the *Tentative Manual for Landing Operations* would three years later. Though accepting the complexity and inherent challenges of the modern amphibious assault, the 1931 committee touted that specialized equipment, diligent practice, and advanced training would all ensure success. In a display of confidence that future Marines were sure to take issue with, the board decreed that "with boats in sufficient numbers, of the proper type, speed and equipment, and with properly trained crews, the advance over water offers no particular disadvantage in itself."³³ At another point in their comments, the board judged that "the yearly target practices of the fleet demonstrate clearly that if the enemy positions were visible on the ground, and the form of the terrain and visibility permitted direct laying on the target, ships' guns could deliver an accurate, effective fire on hostile positions, so concentrated that attacking infantry could advance within reasonable assaulting dis-

³¹ Special Board, Marine Corps Schools, "Enclosure A: General Discussion of Landing Operations," in *Naval Gunfire Support of Landings*, 18 February 1931, HAF 66, COLL/3634, MCHD, Quantico, VA, 5, hereafter "Enclosure A: General Discussion of Landing Operations."

³² "Enclosure A: General Discussion of Landing Operations," 7.

³³ "Enclosure A: General Discussion of Landing Operations," 4.

tance before the fire would have been lifted.”³⁴ Though aware that these conditions for success were more exceptional than typical, the board failed to investigate what might happen when enemy positions were not visible on the ground and enemy forces deliberately camouflaged, misled, and confused American plans. Of course, Japanese units were to take unforgiving advantage of such oversights.

While the special board’s 1931 report included concerning details, neither the committee’s formal conclusions nor the Marines’ *Tentative Manual for Landing Operations* that followed seemed willing to engage with the messy, difficult, perhaps even hopeless dilemma between appropriate naval gunfire coverage and the advance of the landing force. Looking past the official sources and into a personal conversation within the Marine Corps, however, it seems that frustration and skepticism ruled the day. Following his participation on the special board, Major Charles D. Barrett penned a biting letter to a fellow naval officer that revealed deep-seated doubt on the matter. In the context of a personal letter, Barrett seemed much more willing to discuss the inherent and perhaps insurmountable difficulties of the job. Given Barrett’s familiarity with the topic and his participation on the 1931 special board, his discussion of the problem deserves to be quoted at length.

If the [enemy] machine guns open fire at a range as great as 1500 yards and the fire was immediately observed by the ships, they could only shell the beach for two or three minutes at the most, with [friendly] boats traveling at eight knots. It is more than likely that an alert enemy would hold his machine guns’ fire until the disembarkation from the boats actually began, when help from the ships would be absolutely impossible.³⁵

Once the landing force reached the beach, Barrett continued, the problem became even more acute:

Theoretically, aero planes should be able to call for panels and thus keep you advised of the location of your front lines, but practically this does not work out so well.³⁶ Panel men get killed; troops rushing forward cannot watch every plane for signals; troops in woods do not see the panels; planes get shot down

The question then arises as to how to insert artillery fire into this melee and at what stage in the game; that is, from the artillery or ships which previously have not been firing. It seems absolutely impossible while the troops are still moving forward. If you wait until a battalion is stopped, the artillery fire will come too late as the damage will have been done. If you tell the front line troops to stop and call for artillery fire as soon as fired upon, the result manifestly would be a halting hesitating attack and not the energetic operation pushed home to the limit which must be expected from troops that are to succeed.

The foregoing discussion deals primarily with the question of where and when to put the fire, and does not consider the mechanical difficulties of *getting the shells to fall where you want them*. Communications manifestly offer some troublesome problems. Then there is the question of getting the shells to fall on the enemy without doing damage to your own troops.

³⁴ “Enclosure A: General Discussion of Landing Operations,” 7.

³⁵ Charles D. Barrett, “Correspondence: Major C. D. Barrett to CDR H. A. Flannigan,” 15 October 1931, HAF 70, COLL/3634, MCHD, Quantico, VA, 1–2.

³⁶ The term *panel* refers to an “air panel” or board used to communicate between ground forces and friendly aircraft. The ground troops placed these colored panels on the ground to inform pilots of friendly positions and the progress of the attack. This was an early (and cumbersome) method of communication in the early days of air command and control.

We know that we can rarely succeed without artillery fire. If the fire falls on your own troops, it is not simply a question of killing some men, but the result is worse than not having any artillery at all, because the morale of the troops will be destroyed.³⁷

Having established his reservations, Barrett offered a concluding admission that would appear almost verbatim in the Marines' *Tentative Manual for Landing Operations* three years later. Unable to remedy the delicate balance between naval gunfire and the mobile landing force, Barrett conceded that on-call fire support was simply too dangerous, too difficult, and too impossible for the amphibious assault. Accordingly, naval gunfire "support of infantry will have to be, in the future as in the past, according to some prearranged plan" specific to each assault but scripted according to a "timeline" or firing schedule.³⁸ Even for officers as conflicted as Barrett, the timeline solution prevailed over a more responsive and adaptable approach to fire support.

Turning into the Fog: The 1930s Fleet Landing Exercises

With their doubts in hand, Navy and Marine officers alike knew that to make tangible progress with the amphibious assault, they must turn their efforts to practical fleet training. The *Tentative Manual for Landing Operations*, for all its groundbreaking theory, remained little more than an intellectual appraisal in 1934. As General James C. Breckinridge, then in command of Marine Corps Schools in Quantico, put it, the authors of the manual had been "largely groping in the dark."³⁹ The head of the manual's Aviation Committee expressed a similar conviction, stating that their

team had tackled its assigned tasks "with a lantern in one hand and a candle in the other."⁴⁰ Having wrestled with the theory, it was time for practical learning.

Yet, even as a few diligent leaders labored to turn the Navy and Marine Corps' attention toward amphibious training, they encountered a series of hurdles. First and foremost, a shift toward amphibious warfare faced opposition within the Navy Department itself. As historian Craig C. Felker has shown, many senior Navy leaders remained averse to amphibious operations throughout the 1930s. Primarily, their disapproval reflected concern that an amphibious pivot would necessarily dilute other training initiatives and compromise the identity of the fleet. Enchanted with the ideas of Alfred Thayer Mahan, traditionalist officers clung to conventional naval warfare and the great theorist's vision of decisive battle. From this perspective, amphibious operations were nothing more than "a distraction from sea control."⁴¹ As Mahan's disciples saw it, battleships were designed to fight the enemy at sea, not play second fiddle to a landing force laboring its way ashore. In this view, amphibious operations not only degraded but endangered American battleships by tethering them to specific terrain—the landing beach. Restricted to nearby waters, the fleet remained under constant threat from enemy airfields and shore batteries. Under such constraints, Mahan's descendants found it difficult to abide.⁴²

In addition to cultural aversion within the Navy Department, a shortage in manpower plagued the Marines' ability to develop their amphibious efforts. As early as 1932, Commandant Fuller had written that

the reduction of the enlisted strength of the Marine Corps from 18,000 to 15,343 has made it impossible for the corps to carry out its primary mission of supporting the United States Fleet by maintaining a force in readiness to

³⁷ Barrett, "Correspondence: Major C. D. Barrett to CDR H. A. Flannigan," 2–3, emphasis added.

³⁸ Barrett, "Correspondence: Major C. D. Barrett to CDR H. A. Flannigan," 4.

³⁹ James C. Breckinridge, "Remarks of General Breckinridge," in "Conference Proceedings Discussing, Approving, or Commenting on the Various Headings and Sub-Headings of the Tentative Manual for Landing Operations," 1934, HAF 41, COLL/3634, MCHD, Quantico, VA, 1.

⁴⁰ "Remarks by Captain Campbell, Aviation Committee, Landing Operations Manual," in "Conference Proceedings Discussing, Approving, or Commenting on the Various Headings and Sub-Headings of the Tentative Manual for Landing Operations," 1934, HAF 41, COLL/3634, MCHD, Quantico, VA, 1.

⁴¹ Felker, *Testing American Sea Power*, 100.

⁴² Felker, *Testing American Sea Power*, 100.

operate with the fleet. On the present strength only weakly skeletonized organizations of such arms that are essential to a modern military force can be maintained.⁴³

At the time of Fuller's words, the Great Depression had helped to cap the Hoover-era Marine Corps. Yet even as the interwar years ticked by—and war became more likely—the Marines' manpower problem persisted. Five years later, in 1937, the enlisted force had grown by only 1,100 personnel. By 1939, total enlisted manpower reached just 17,500. Convinced that offensive naval forces had helped precipitate World War I, and equally certain that the Marine Corps represented an aggressive, interventionist tool, Congress embraced isolationist policies and strict caps that kept the Service modest in size.⁴⁴

On top of its general manpower constraints, a litany of military duties helped to further dilute the Marine Corps' interwar focus on amphibious training. As late as 1937, just 24 percent of the Service's enlisted personnel served in Fleet Marine Force units. The remainder of the Corps filled shipboard duties, domestic and foreign guard duties, and expeditionary units (particularly in China). By 1939—and even as the international crises in Asia and Europe became more acute—the proportion of Marines in the Fleet Marine Force actually dropped to 20 percent, just 3,422 of its 17,500 enlisted troops. Not until 1940 did the Fleet Marine Force's proportion of manpower begin to surge, when 42 percent of the Corps served in such a capacity.⁴⁵

Even in spite of 1930s personnel challenges and the powerful influence of Mahanian theory, the Navy

and Marine Corps did begin to shift some attention toward the amphibious mission. After a hasty 1934 fleet maneuver in the Caribbean, the two Services initiated a series of large-scale amphibious exercises meant to test American doctrine and procedures between 1935 and 1941. Appropriately titled Fleet Landing Exercises, or FLEXs for short, the annual drills drew together landing troops, naval gunfire platforms, and aviation sections for common training. Within the exercises, the Navy and Marine Corps made notable progress in particular elements of the amphibious assault. The design of landing craft improved reliably, with Andrew Higgins's Eureka prototype (eventually the famed Higgins boat) and the lesser-known Donald Roebling's amphibian tractor (a.k.a. alligator) both emerging from the FLEX continuum. In addition, casualty evacuation procedures, beach organization practices, and the logistics behind the assault all matured.⁴⁶

But in spite of these humble strides and a genuine desire for realistic training conditions, the Services' annual maneuvers suffered from debilitating artificialities. To reduce confusion on the beaches and maximize safety, the exercise umpires used stationary flags to represent enemy units and wooden targets to signify enemy pillboxes and bunkers. Consequently, the drills looked more like target practice than realistic maneuvers. Gunfire officers embraced area bombing over point-targeting, confident that a broad sweep of naval fires could do the job for the landing force. The umpires often prohibited naval gunfire training while friendly troops were ashore and instead directed the naval guns to fire on separate beaches and islands. Safe from each other's fires, the detached American forces failed to appreciate the tremendous complexity and onerous burden of coordinating naval gunfire under the chaotic and dynamic circumstances of an amphibious attack.⁴⁷

Artificialities hampered the integration of aviation units in a comparable manner. Following FLEX 3

⁴³ "Report of the Major General Commandant of the United States Marine Corps," in *Annual Reports of the Navy Department for the Fiscal Year 1932* (Washington, DC: Government Printing Office, 1932), 1163.

⁴⁴ *Annual Report of the Secretary of the Navy for the Fiscal Year 1937* (Washington, DC: Government Printing Office, 1937), 17; *Annual Report of the Secretary of the Navy for the Fiscal Year 1939* (Washington, DC: Government Printing Office, 1939), 19; and Millett, *Semper Fidelis*, 320, 335.

⁴⁵ *Annual Report of the Secretary of the Navy for the Fiscal Year 1937*, 17; *Annual Report of the Secretary of the Navy for the Fiscal Year 1939*, 19; and *Annual Report of the Secretary of the Navy for the Fiscal Year 1940* (Washington, DC: Government Printing Office, 1940), 18.

⁴⁶ B. W. Gally, "A History of U.S. Fleet Landing Exercises," 3 July 1939, HAF 73, COLL/3634, MCHD, Quantico, VA; Millett, *Semper Fidelis*, 338–40; and Krulak, *First to Fight*, 88–99.

⁴⁷ Gally, "A History of U.S. Fleet Landing Exercises," 5–6; and Millett, *Semper Fidelis*, 337–41.

in 1938, Captain W. C. Lemly drafted a biting critique of the operation: “First of all I should like to speak of artificialities. The San Clemente [California] Exercise was full of them. The realistic element was not stressed enough.” Because of the limitations, Lemly charged, the exercise was “little more realistic than a map problem.” In his piercing conclusion, the aviator professed that “the training and benefit the squadron received in carrying out this operation order, other than through a vigorous exercise of the imagination, was practically nil.”⁴⁸

Throughout the FLEXs, Marines training ashore complained that the aviators lacked familiarity with the ground situation and were therefore unable to provide effective air support. Mechanical problems and communication errors often delayed the aircraft, leaving troops to clamor for more flexibility and responsiveness from their comrades overhead. In most training runs, the naval pilots focused on internal capabilities and missions, with only peripheral concern for amphibious integration.⁴⁹ Almost completely, units valued training safely over training realistically. As historian Allan Millett summarized, “The aviation bombing and strafing practices were, like the shore bombardments, so restricted by safety precautions that their utility was limited.”⁵⁰ Throughout the interwar exercises, and in part because of the maneuvers’ limitations, timely and effective air support remained elusive.

FLEX planners tolerated artificialities in the annual drills for a number of understandable—if not entirely defensible—reasons. First and foremost, commanders prioritized the safety of their troops and the survival of their equipment over the authenticity of battlefield conditions. For most officers, the desire to preserve life and limb was simply too strong. Budget limitations and a desire for simplicity also pushed the exercises toward artificiality. Training in a separate

and scripted manner meant that the naval gunners could focus on their task of delivering shells ashore while the landing force focused on its mission of attacking the beach. Each of these factors contributed, however innocently, to unrealistic training conditions in the 1930s FLEXs.

In short—as the Navy and Marine Corps focused almost singularly on their own individual tasks—the FLEXs consistently avoided the messy but essential business of coordinating triphibious operations and, in particular, triphibious firepower. Efficient and safe as it was in peacetime drills, the isolated and careful approach left little emphasis for the larger integration of the task force. Instead of refining communication procedures and cooperation techniques between shipboard gunners, attacking aircraft, and infantry units, most ships obsessed about proper shell and fuse combinations for the wooden targets they prosecuted. The landing force was equally content to focus on its own journey from the transport ships to the beach, as well as the logistics and other internal support measures that would sustain it ashore. Absorbed in their own quite challenging tasks, few leaders were concerned about the delicate orchestration of land, sea, and air actions.

Even as early as 1936, however, lonely voices of concern surfaced. Rear Admiral Hayne Ellis, after observing Fleet Landing Exercise Number 2, argued that the landing force was understrength in both firepower and personnel. The exercise, he judged, had provided insufficient training on the integration and fire support necessary to seize the beach. He came to the depressing conclusion that “against any sort of determined and resourceful opposition it is believed that the strength of the Fleet Marine Force is totally inadequate, for the purpose designated.”⁵¹ Following the next annual drill in 1937, Lieutenant Colonel B. W. Gally added to the admiral’s skepticism, arguing that even “complete and detailed orders cannot make up for a lack of training in a composite organization consisting of units that have not previously trained

⁴⁸ Capt W. C. Lemly, “Lessons Learned by Aviation from Fleet Landing Exercise No. 3,” 1938, HAF 118, COLL/3634, MCHD, Quantico, VA, 1.

⁴⁹ David L. Nutter, “Gunfire Support in Fleet Landing Exercises,” 1939, HAF 73, COLL/3634, MCHD, Quantico, VA; Rothenberg, “From Gallipoli to Guadalcanal,” 178; and Millett, *Semper Fidelis*, 337–41.

⁵⁰ Millett, *Semper Fidelis*, 338.

⁵¹ As quoted in Gally, “A History of U.S. Fleet Landing Exercises,” 6.

together.⁵² By 1938, yet another critic went so far as to offer a solution in their post-exercise report: “Troops should be required to request naval gunfire support to give needed training in coordination.” Dodging the task was foolish, they continued, since these exact types of bombardments seem “quite certain to be required of our battleships in case of war. It is an intricate problem for which we lack much preparation.”⁵³

The following year, Navy commander C. G. Richardson reflected these same sentiments, petitioning that “[our] fire control must provide for great flexibility of fire . . . and gun groups must permit heavy fire to be laid down immediately on any target observed.” Since the interwar theory and associated war plans called for landing operations, he continued, “it is squarely up to us who comprise the naval service to accept this decision and proceed to the solution of the problem, no matter how involved or how difficult it may be.”⁵⁴ But the pleas of Richardson and his predecessors often fell on deaf ears, as the majority of the naval officer corps sustained its preference for conventional fleet engagements.

Put simply—and in spite of the lonely critics—the late 1930s exercises revealed that U.S. Navy officers expected the destructiveness of their guns to win the battle outright. They would fire on the enemy, offload

the Marines, and return to their cherished purpose of fighting at sea. Naval aviation’s mission, except for the most committed of carrier warfare proponents, was to support battleship gunnery and reconnoiter the battlefield. For the Marines’ part, they appeared content that supporting firepower would knock down enemy defenses, get the landing force ashore, and adequately assist the attack.

Between the world wars, very few American officers—either Navy or Marine—anticipated the inherent complexity and difficulty of triphibious coordination, integration, and flexibility. Each of these principles seemed unworthy of their close attention or concern. Between 1935 and 1941, the Navy and Marine Corps’ FLEXs failed to sufficiently address the orchestration of land, sea, and air operations. If the landing force was to get ashore against a fortified, prepared, and equipped enemy, someone had to synchronize the troop movements with the supporting munitions. The Navy and Marine Corps’ dismissal of these challenges during the interwar years bordered on professional ignorance. More tragically, it left the Americans categorically unprepared, at the outbreak of the Second World War, to effectively coordinate and integrate firepower during a contested amphibious assault.

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⁵² Gally, “A History of U.S. Fleet Landing Exercises,” 8.

⁵³ “Report of Gunnery Exercises,” in *Fleet Training Publication 203-1*, 1939, HAF 148, COLL/3634, MCHD, Quantico, VA, 44, 46.

⁵⁴ Cdr C. G. Richardson, USN, “Naval Gunfire Support of Landing Operations,” 1939, HAF 64, COLL/3634, Quantico, VA, 4, 33–34.