The Siege of Enniskillen Castle, 1594

AN OBJECT LESSON IN COMBAT ACROSS THE LAND-WATER INTERFACE

By Captain Jamie McGrath, USN (Ret)

Abstract: The U.S. Marine Corps spent the years between the world wars developing a doctrine of opposed landings from the sea in an arena where the ocean provided the only maneuver space, but the opposed amphibious operation is not the province of ocean-borne amphibious assaults alone. The land-water interface impacts warfare well inland from the coast, and much can be learned from the application of riverine and lacustrine amphibious assaults found in history. One such example is the siege of Enniskillen Castle in Ireland in 1594. English operations at Enniskillen demonstrated the value of coordinated waterborne and land-based forces at the tactical level. Considering English lacustrine operations in the Irish Nine Years' War (1593–1603) and U.S. riverine warfare experiences in the American Civil War and Vietnam War can inform Marine planners as they develop the tactics, techniques, and procedures of the Marine Littoral Regiments.

Keywords: riverine, amphibious, inland amphibious warfare, stand-in force, Marine Littoral Regiment, land-water interface, riverine assault, lacustrine assault, littorals, Nine Years' War, Tyrone rebellion, Enniskillen Castle

Introduction

For many naval enthusiasts, the roots of amphibious warfare reach back only as far as the British disaster at Gallipoli in 1914–15. Looking more broadly, the use of the sea as a military maneuver space dates to antiquity, but primarily as navies transporting an army to an undefended landing site, after which the army engages in land warfare once established ashore. The U.S. Marine Corps famously spent the years between World War I and II developing a doctrine of opposed landings from the sea in an arena where the ocean provided the only maneuver space. Even today, amphibious doctrine talks of naval task forces and combined arms landing forces derived from that interwar development. But the opposed amphibious operation is not the province of ocean-borne amphibious assaults alone. The land-water interface impacts warfare well inland from the coast, and much can be learned from the application of riverine and lacustrine amphibious assaults found in history.[1] Considering English riverine/lacustrine operations in the Irish Nine Years' War (1593–1603, a.k.a. the Tyrone rebellion) and U.S. riverine warfare experiences in the American Civil War and Vietnam War can inform Marine planners as they develop the

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[1] *Lacustrine*: related to or associated with lakes.

tactics, techniques, and procedures of the Marine Littoral Regiment.

England conducted amphibious operations in several theaters at the end of the sixteenth century, including several riverine and lacustrine operations executed in Ireland during the Nine Years' War. Ireland's riverine and lacustrine nature encouraged an amphibious strategy, and both Irish and English forces adopted tactics to deal with the Irish geography. As historian Mark C. Fissel notes, the result was that English amphibious operations in Ireland were "remarkably and consistently successful in a theater of operations where the English were failing in the prosecution of land warfare."[2] The siege and assault on the Irish castle at Enniskillen provide one example of Irish and English operations among Ireland's rivers and loughs.[3] Operations such as those at Enniskillen help demonstrate why the English eventually succeeded in quelling the rebellious Irish lords.

This article began as an exercise in historical writing from limited primary sources. In this case, a combination of written and visual evidence about the English capture of Enniskillen Castle allows for some detailed analysis of one specific amphibious operation in Ulster early in the Nine Years' War. The evidence available for that exercise, being from English sources alone, provides an incomplete picture of events. But the compelling nature of the event, its connection to the broader amphibious campaign in Ulster and as an example of inland amphibious warfare, provides a catalyst for discussion of the expanded nature of amphibious operations that might be encountered by a stand-in force such as the modern Marine Littoral Regiment.

Riverine and Lacustrine Warfare

Since land transportation was slow and ineffective at easily carrying large quantities of material until the twentieth century, water transport was the preferred method of moving goods between communities. Seaports situated far inland on bays and rivers supported the transshipment of goods in and out of the hinterlands. Rivers and canals thus served as corridors to the sea, connecting inland communities, resources, and wealth to the international market. These fluvial systems of waterways and seaports supported entire regions, and control of the waterways was often crucial to control those regions. Rivers, lakes, and canals remain a highly efficient mode of transporting large amounts of goods for relatively low cost. These inland waters remain the loci of commerce and civic life. This is especially true in areas with underdeveloped road systems and rail networks. Even in regions with extensive road and rail networks that allow efficient movement of goods over land, waterways remain critical avenues of transport and, therefore, areas vital to military operations in riverine and lacustrine environments.

Inland amphibious warfare, referred to colloquially today as riverine or brown water operations, like its open water cousins, sea control and sea denial, focuses on two essential elements. The first is to preserve freedom of action to use the rivers and lakes as a maneuver space, to project power, and to protect friendly commerce and military traffic along riverine, lacustrine, and coastal waterways. The second is denying the enemy that freedom of action by disrupting their ability to operate in that same terrain. These competing elements present significant challenges due to the often-expansive nature of the fluvial system supporting a given region. Control of seaports alone is insufficient to control a fluvial system since multiple rivers, lakes, and canals feed individual ports. However, seizing critical junctures could disrupt the ability to move goods or troops over the waterways. By identifying these critical points, effective defenses could be erected, or offensive military operations could be focused.

One method of control is to fortify key terrains, such as river junctions, narrow channels, or points through which most traffic must pass. In the British

[2] Mark C. Fissel, "English Amphibious Warfare, 1587–1656: Galleons, Galleys, Longboats and Cots," in *Amphibious Warfare, 1000–1700: Commerce, State Formation and European Expansion*, ed. D. J. B. Trim and Mark Fissel (Leiden, NL: Brill, 2006), 218.
[3] *Lough*: lake (Ireland).

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Enniskillen Castle.

Isles during the Elizabethan period, these fortified positions often took the form of forts or fortified castles erected along the riverbanks and lough shores. Such fortifications became the object of military operations.[4]

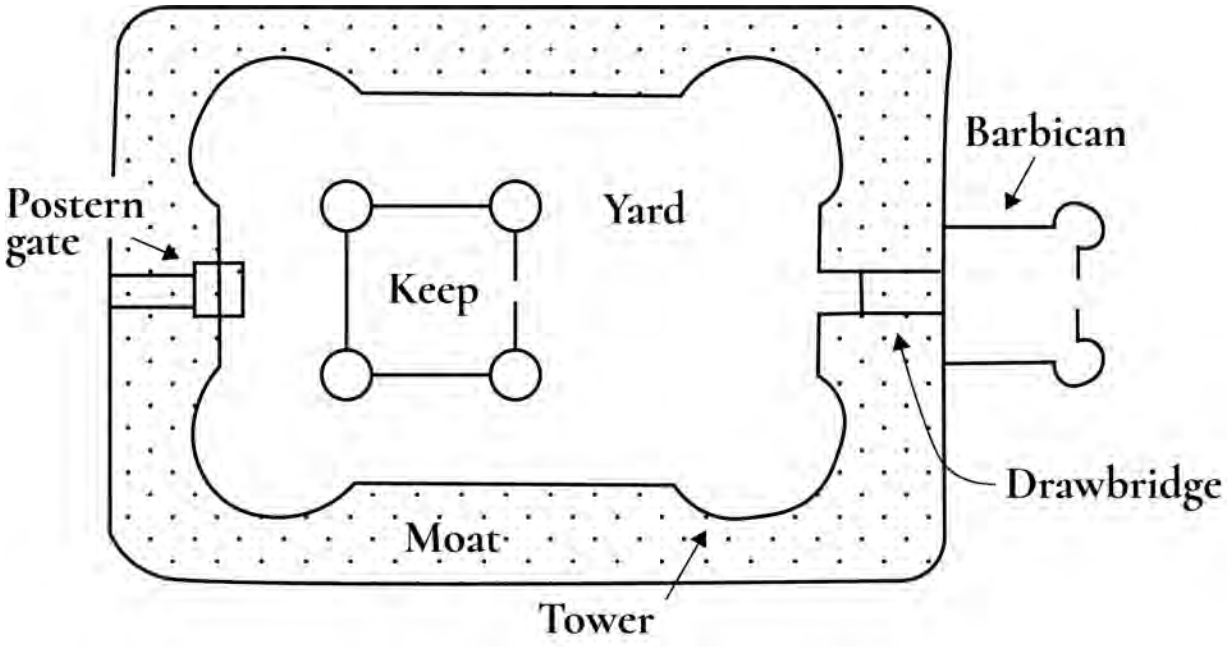
Irish Way of War

The fluvial systems that defined much of northern Ireland consisted of a series of loughs and rivers combined with bogs and wooded corries and drumlins subject to frequent flooding.[5] This geography made waterborne movement an effective method of military operations. It also presented critical locations that controlled the flow of commercial and military traffic in the waterways. Traditionally, the Irish fortified these vital points by erecting keeps on islands in the middle of loughs.[6]

Enniskillen Castle is an example of such a fortification. Built in the early 1400s by Hugh "The Hospitable" Maguire (d. 1428), Enniskillen Castle stood on an island in the River Erne as it flows from Upper to Lower Lough Erne.[7] John Thomas's illustration of the siege of Enniskillen Castle shows it occupying the entirety of its island and positioned on a bend in the river, allowing the castle to command about 270 degrees of river approaches.[8]

[4] D. J. B. Trim, "Medieval and Early-Modern Inshore, Estuarine, Riverine and Lacustrine Warfare," in *Amphibious Warfare, 1000–1700*, 360–63.
[5] *Corries*: horseshoe-shaped vallies formed through erosion by ice or glaciers; *drumlin*: a hill made of glacial till deposited by a moving glacier, usually shaped like half an egg.

[6] Fissel, "English Amphibious Warfare, 1587–1656," 235.
[7] John Thomas, "Siege of Enniskillen Castle, 1594," color illustration, C13343-69, Cotton Augustus I.ii.39, British Library Board; and Paul Logue, "Siege of Enniskillen Castle Map, 1594," PDF, Fermanagh, A Story in 100 Objects, Fermanagh County Museum, 1, accessed 25 September 2016.
[8] Thomas, "Siege of Enniskillen Castle, 1594."



Adapted by MCUP

Parts of a typical medieval castle.

Recognizing the vulnerability of these keeps to amphibious assault, the Irish constructed sconces, or small defensive earthworks, surrounding the keep. They planted sharpened stakes in the water approaches to foul assaulting boats. Irish castles varied in design, but the construction of Enniskillen Castle featured a barbican containing a single landward gate with a bridge across the narrow portion of the river that served as a moat. The castle walls surrounded a central keep that stood four stories tall, capped with a catwalk that provided commanding views in all directions. The height of the keep also allowed for plunging fire on forces attacking the barbican.[9]

In his book, *At the Water's Edge*, Theodore Gatchel describes three basic methods of amphibious defense: the naval defense, defense at the water's edge, and the mobile land defense.[10] Although written to describe twentieth-century amphibious operations, these defense methods also reflect those available to forces in the late 1500s. Lacking a naval force, the naval defense was not an option for the Irish, and the Irish tactic of retreating to their keep removed the prospect of a mobile land defense. This limited the defensive options to defending at the water's edge and thus inhibited their ability to engage the English amphibious raids where they were most vulnerable, on the water and during disembarkation. Fissel notes in his analysis of the Nine Years' War that, given Irish specialization in mobile operations, it is amazing that defenders sat in wait instead of going out and disrupting the attack.[11]

English Way of War

English amphibious operations in Ireland during the Nine Years' War proved significantly more successful than those attempted by the English in their concurrent war against Spain. When the English arrived in Ireland to quell the rebellious lords, they recognized the need for amphibious capability and transformed their transport watercraft into vessels of war. The geography of Ulster, a vital center of the conflict, with its maze of waterways, lent itself to the use of combined land and waterborne operations, in other words, amphibious operations. The frequent inundation of the Irish landscape made land operations problematic and compelled the English to depend on riverine and

[9] Thomas, "Siege of Enniskillen Castle, 1594."
[10] Theodore L. Gatchel, *At the Water's Edge: Defending Against the Modern Amphibious Assault* (Annapolis, MD: Naval Institute Press, 1996), 2–3.
[11] Fissel, "English Amphibious Warfare, 1587–1656," 235.

lacustrine transportation. Control of the river routes was essential to subjugating the region and, by extension, the whole of Ireland.[12]

Captain Sir John Dowdall (ca. 1545–ca. 1608) pioneered Hibernian amphibious operations, and his assault on Enniskillen Castle demonstrated the amphibious tactics adopted by the English. Those tactics focused on firepower and mobility, including the use of light, shallow draft cots, and longboats.[13] One key element to English success was adapting material, both indigenous and already in hand, to the local geography. The English adopted the longboats carried by English seagoing vessels for use in Ireland. Frequently employed as landing boats from larger sailing ships, eight or ten oarsmen rowed the longboat, which had good seakeeping qualities that allowed it to operate in the surf zone. Cots were indigenous flat-bottom boats explicitly developed for the loughs and rivers in Ireland.[14] Operations on Irish rivers required oared vessels to maneuver in the many twists, turns, and hilly terrain, as wind power was unreliable. The boats also carried a medium-caliber swivel gun in the bows, which allowed the English to bring firepower to bear on the Irish castles from their less-defended waterside.[15] It is, however, important to note that larger caliber artillery available to the English was not fielded at Enniskillen due to the limited carrying capacity of the boats available, a potential limitation to inland amphibious operations conducted in the modern era as well.[16]

Modern Riverine Warfare

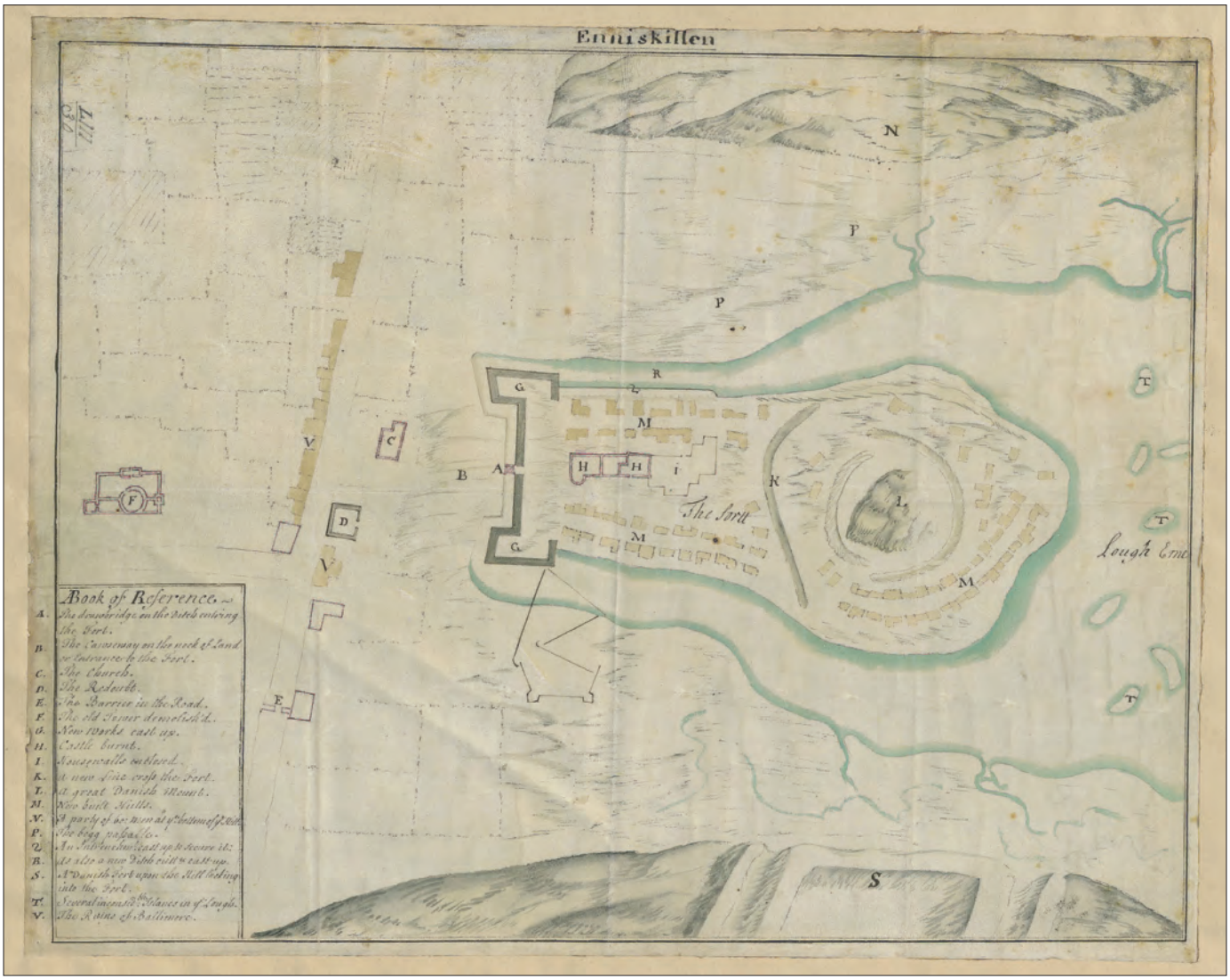
Amphibious operations in a riverine environment remain relevant today. But the U.S. military "is not adequately prepared to use rivers as a maneuver space—or prevent adversaries from doing the same—and it has not been for years."[17] This is despite several examples of riverine warfare in America's past.

The primary examples of American riverine war began as ad hoc operations, adapting existing equipment, just as the English did for the operations around Enniskillen Castle. During the American Civil War, Union forces in the western theater and the Chesapeake basin adapted local warcraft for use as transports and gunfire support vessels to use the rivers as maneuver spaces. In the west, General Ulysses S. Grant used his riverine forces to bypass, outflank, or surround Confederate strongholds. In the east, Union forces used the rivers that penetrate inland from the Chesapeake Bay to rapidly move forces toward Richmond, Virginia, provide fire support to troops battling along the peninsulas, and resupply ground forces. They also used the rivers to evacuate troops, an all-too-frequent occurrence in these peninsular campaigns. Using rivers as a maneuver space proved critical to Union victories in the west. While less conclusive in the east, the rivers provided critical logistical avenues for Union forces, especially in Grant's final campaign.

A century later, during the Vietnam War, the Navy and Marines again adapted existing equipment to the riverine fight. Riverine operations combined swift patrol boats, plodding fortified landing craft, and fast-moving light attack helicopters to engage the National Liberation Front/People's Liberation Army in the expansive river deltas of southern Vietnam. While primarily a Navy mission and often conducted from the water alone, Marines provided the land component for the more complex operations when needed to control key terrain along the rivers. While heroic, the riverine operations of the Vietnam War were inconclusive and, like the English seizure of Enniskillen centuries before, ultimately contributed little to the war's eventual outcome.

The U.S. Navy maintains a limited riverine capability in the Navy Expeditionary Combat Command (NECC). Much of the contemporary iteration of this

[12] Fissel, "English Amphibious Warfare, 1587–1656," 233.
[13] Fissel, "English Amphibious Warfare, 1587–1656," 218, 233–36; and Hans C. Hamilton, ed., *Calendar of the State Papers, Relating to Ireland, of the Reigns of Henry VIII, Edward VI, Mary, and Elizabeth*, vol. 5, *October 1592 to June 1596* (London: Eyre and Spottiswoode, 1890), 210.
[14] "Traditional Boats and Replicas," Irish Waterways History, accessed 5 April 2022.
[15] Fissel, "English Amphibious Warfare, 1587–1656," 234.
[16] Fissel, "English Amphibious Warfare, 1587–1656," 236.
[17] Walker Mills, "More than 'Wet Gap Crossings': Riverine Capabilities Are Needed for Irregular Warfare and Beyond," *Modern War Institute*, 9 February 2023.



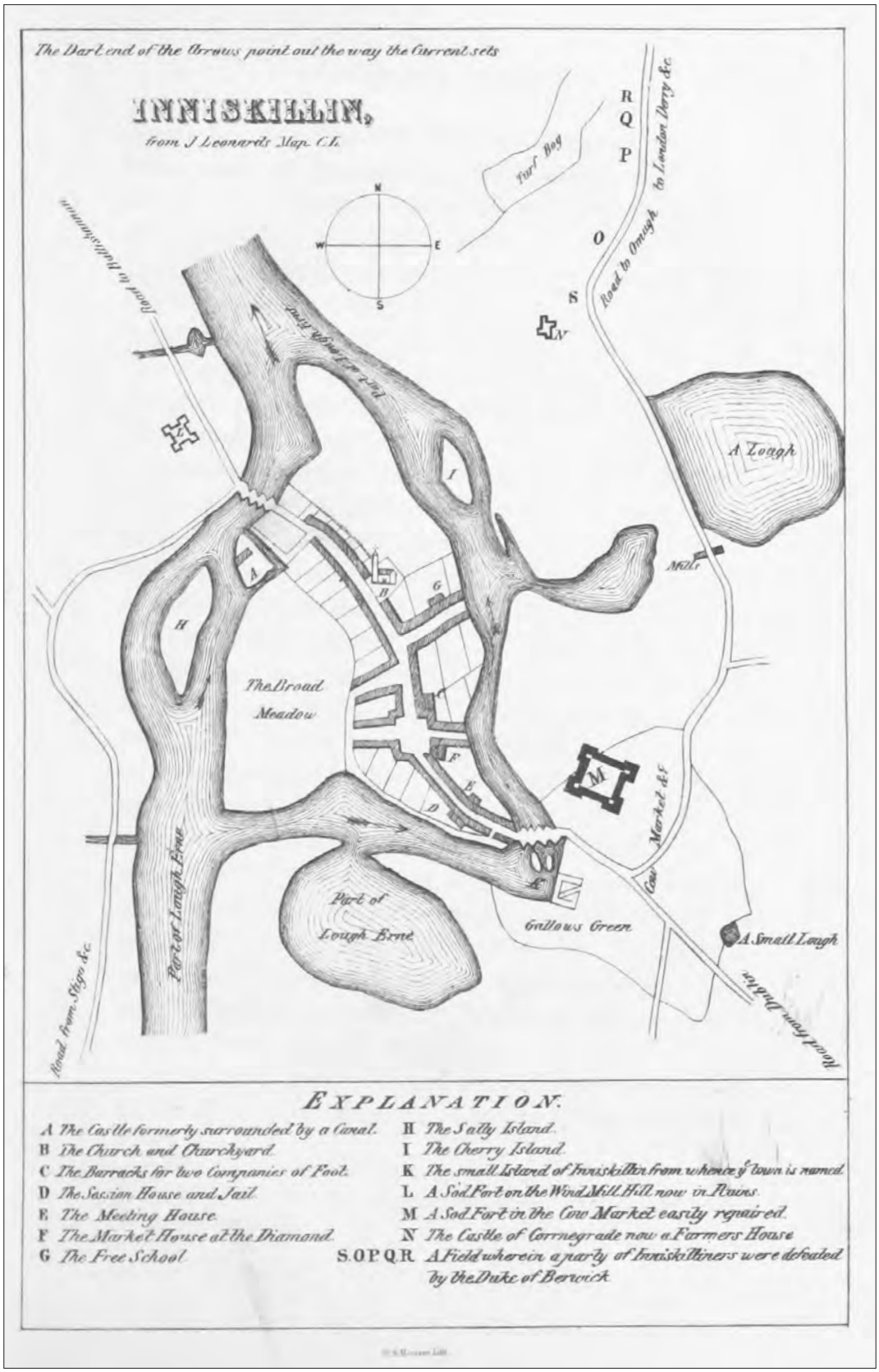
Map of Enniskillen, ID 004982433, King's Topographical Collection, George III, King of Great Britain, former owner. Enniskillen, 1690, British Library Board
Enniskillen, 1690, map on vellum. This map shows the motte and bailey mound on the peninsula and the new works about the castle, hills above and below, with Lough Erne to the right. Includes a key to the lower left within a cartouche.

Navy mission evolved during the Marine Corps' focus on counterinsurgency operations, throughout which time the Corps abandoned riverine operations. But the Navy's capability lacks the robust land component required to expand and exploit control of the rivers and lakes by seizing and controlling the adjacent key terrain. Additionally, in the past few years, the Navy has reduced its riverine capability, citing its lack of relevance as the Navy reshapes its force to counter threats from Russia and the People's Republic of China—the very threats that the Corps' expeditionary advanced base operations are designed to address.[18]

The Siege of Enniskillen Castle

Hugh Maguire (d. 1600) led some of the forces in the Irish rebellion and controlled a major avenue (the Erne) in Ulster with the castle Enniskillen, built by his ancestor Hugh the Hospitable. As long as Maguire held this chokepoint on the Erne, he stymied the English ability to subdue Ulster. In the summer of 1593,

[18] Richard R. Burgess, "The Navy's Shrinking Patrol Boat Force," *Seapower*, 2 June 2021.



ID 015115593, Robert Cane, The History of the Williamite and Jacobite Wars in Ireland; from Their Origin to the Capture of Athlone. [With Plates and Maps.] (1859), 137, British Library Board

Enniskillen, map.

the lord deputy in Dublin offered Maguire protection for two months if he would disband his forces and lay down his arms. Maguire countered with a request for six months of protection and stipulated the discharge of Sir Richard Bingham's troops as well, thinking that Bingham's troops were forming to invade his lands. The lord deputy, doubting Maguire's motives, dismissed this request, noting "the Council and I dare not give order to discharge the soldiers until we know what will become of this traitor Maguire."[19] Unwilling to deal with Maguire and his "traitorous" band, the English determined that he must be defeated militarily. On 11 October 1593, English forces under Sir Henry Bagenall (ca. 1556–98) scored "a splendid victory over Maguire's full strength, being 1,000 foot and 160 horse, 300 slain . . . near the Ford of Golune."[20] Maguire's defeated force retreated to his fortified castle at Enniskillen, where they awaited the English assault.

Ensconced in Enniskillen Castle, Maguire's men must have felt secure from English attack. Situated as it was, the castle provided commanding views of the approaches in all directions. The castle walls abutted the river on two and a half sides, with a narrow channel of the river forming a moat on the remaining sides, making a land approach relatively confined and easily defended. The land approach to the castle was also an island, providing an additional barrier for attackers to cross. To enhance the defensive barrier provided by the island, the castle builders had placed sconces at the entrances to the section of the river that had to be crossed, blocking river access to the island. Complementing the sconces were stakes planted in the river approaches to the castle designed to foul any boats attempting to pass.[21] The castle consisted of an outer wall surrounding a tower keep—a tall, sturdy structure with loopholes for firing on attacking forces. A tower and a narrow bridge that canalized an attacking force protected the single land gate. Atop the wall was a protected catwalk from which defenders could fire down on attacking troops and quickly reposition within the castle's defenses.[22]

Captain John Dowdall's troops arrived outside Enniskillen Castle in early January 1594. With accounts of Maguire's strength running from less than 50 to more than 500 troops, Dowdall had to plan his attack carefully to ensure victory. Rather than storm the castle immediately, Dowdall worked to position his force and harass Maguire's supply lines. In a letter to the lord deputy in Dublin, Dowdall reported that he "took 700 cows from the traitor" on 18 January. Thinking Dowdall's troops were his own, Maguire came out in a cot to investigate, and the English troops fired on the cot, killing two men. Dowdall followed this with an assault on one of the sconces defending the castle, putting "the defenders to the sword, and burned the same."[23]

To ensure sufficient forces to take Enniskillen Castle, Dowdall had requested reinforcements from Bingham. These forces arrived during the next few days and were employed in besieging the castle. By 25 January, the English had "entrenched and placed our shot within one caliver shot of the Castle, and the same night we placed our three [falconets]."[24] Drawings of the siege indicate that these entrenchments laid down fire on the castle from two directions. Two positions placed across the River Erne, west of the castle, under the command of Captain Bingham, took the castle under fire with muskets, a falconet cannon, and a robinet cannon.[25] None of these weapons could penetrate the castle's thick walls, but their fire kept the Irish defenders behind their defenses. Additionally, based on their position relative to the castle entrance, the English could fire into the flank of any force that ventured out of the castle against them.

[19] Hamilton, *Calendar of the State Papers, Relating to Ireland, of the Reigns of Henry VIII, Edward VI, Mary, and Elizabeth*, 127–28.
[20] Hamilton, *Calendar of the State Papers, Relating to Ireland, of the Reigns of Henry VIII, Edward VI, Mary, and Elizabeth*, 166–67.
[21] Fissel, "English Amphibious Warfare, 1587–1656," 235.
[22] Thomas, "Siege of Enniskillen Castle, 1594."
[23] Hamilton, *Calendar of the State Papers, Relating to Ireland, of the Reigns of Henry VIII, Edward VI, Mary, and Elizabeth*, 199–203, 204.
[24] The *caliver* is halfway between a musket and an arquebus and has a higher bore and heavier barrel than the arquebus, but is otherwise identical in design. A *falconet* was a light cannon that fired a one-pound ball about 5,000 yards. Hamilton, *Calendar of the State Papers, Relating to Ireland, of the Reigns of Henry VIII, Edward VI, Mary, and Elizabeth*, 204.
[25] A *robinet* was a light cannon that fired a three-quarter pound shot with a range of approximately 2,000 yards. Thomas, "Siege of Enniskillen Castle, 1594."

Photo courtesy of the author

Trim Castle, County Meath, Ireland, provides an example of a medieval castle barbican (right) and keep (center).

Amphibious operations on 24 January by Dowdall's forces facilitated the placement of English entrenchments on the island adjacent to the castle. English troops passed the castle in the river and were forced, by sconces and stakes that hindered further passage of their boats, to put men ashore to defeat these defenses. Defeating the sconces allowed the English to advance, using a sowe to shield them from musket fire from the castle, and to place the three falconet cannons mentioned in Dowdall's report and additional musketeers in entrenchments south of the castle, directly across from the castle gate.[26]

The castle's defenders returned musket fire at both entrenchments but likely lacked cannons in the castle for heavier fire against the attackers. Thirty-six men defended the castle, and 30 or 40 women or children were holed up within its walls.[27] The defenders had retreated into the castle when Dowdall's force overran the sconces on the island's eastern end adjacent to the castle earlier in the assault. Curiously, the defenders left intact the bridge to the castle gate, depending on the gate's sturdy door for defense against a breach of the barbican.[28]

The siege of Enniskillen Castle lasted nine days before Dowdall launched his assault from the Erne on 2 February 1594. The assault consisted of three vessels:

[26] A *sowe* is a siege engine used to protect assaulting forces. Thomas, "Siege of Enniskillen Castle, 1594."

[27] Thomas, "Siege of Enniskillen Castle, 1594"; and Hamilton, *Calendar of the State Papers, Relating to Ireland, of the Reigns of Henry VIII, Edward VI, Mary, and Elizabeth*, 210.

[28] Logue, "Siege of Enniskillen Castle Map," 6; and Thomas, "Siege of Enniskillen Castle, 1594."

a "greate boate" carried the breaching force, and two cots provided a scaling party. Twelve oarsmen powered the greate boate, covered with hurdells and hides to protect the 100 men inside.[29] The two cots, each rowed by 8 oarsmen, carried 15 troops with a scaling ladder in the stern and were armed with a swivel gun in the bow. The assault force, under cover of the musket and cannon fire of the English entrenchments "assault[ed] the castle by boats, by engines, by sap, and by scaling," with the greate boate laying alongside the western barbican and the two cots scaling the southern barbican.[30] To save himself from hanging, Connor O'Cassidy, Maguire's messenger whom the English had captured, served as a guide to Dowdall's assault force and helped the English place their assault craft in the best position to breach the barbican. The men of the greate boate breached the castle wall using "pickaxes and other instruments."[31] Once the wall was breached, Maguire's defenders retreated into the keep where, according to O'Cassidy, they were forced to surrender under threat of being blown up by powder.[32]

With Enniskillen Castle now in the hands of the crown, Dowdall garrisoned it with 30 men, 10 from each company present, and set to "ransacking all [Maguire's] sconces in their loughs and islands wheresoever."[33] While losses during the siege and assault were minimal on both sides, Dowdall's forces slaughtered the Irish occupants of the castle, and sickness soon reduced the English ranks to one-half their original strength. Thus, despite successfully taking Enniskillen in the siege, Dowdall withdrew the majority of his garrison, leaving only 100 men to maintain a hold on the castle and surrounding areas.

Unfortunately for the English, the capture of Enniskillen did not end the rebellion in Ulster. Within six months, the garrison was besieged by Maguire's forces, prompting Sir Henry Duke and Sir Edward Herbert to mount a relief expedition to the castle in August 1594. This English expedition was defeated at the Battle of the Ford of the Biscuits, but the garrison at Enniskillen held until relieved by another expedition later that summer.[34] Strategically, the capture of Enniskillen may have been of little consequence. Still, its seizure demonstrates how the effective use of inland amphibious warfare can achieve military objectives in riverine and lacustrine environments.

Lessons for the Modern Marine Corps

Considering English riverine operations in the Nine Years' War, such as the siege of Enniskillen Castle, in addition to the American river warfare experiences in the American Civil War and Vietnam War, can inform Marine planners as they develop the tactics, techniques, and procedures of the Marine Littoral Regiment (MLR). It may be difficult to see lessons for today's Marine Corps from a sixteenth-century assault on a river-island castle. Technology has clearly advanced from the falconets, cots, greate boates, and scaling ladders employed by the English in their assault on Enniskillen Castle. But lessons abound as the Marine Corps seeks to reinvent itself as a stand-in force for the twenty-first century.

The first thing to note is the pervasiveness of rivers and lakes that crisscross the land of the littorals where the Marine Corps intends to operate, such as the islands of the Philippine archipelago or the littorals of Southeast Asia. Movement of traditional infantry or other ground forces is constrained in riverine, lacustrine, and archipelagic regions as small amounts of land are interspersed with rivers, marshes, lakes, and other water features. If the Marines wish to be a stand-in force in the western Pacific and Southeast Asia littorals, they will need to be able to operate seamlessly across the inland land-water interface.

[29] A *hurdell* (or hurdle) during this period was a light section of fencing used for temporary barriers, for crossing rivers, and, in this case, as light armor against projectile weapons.
[30] Hamilton, *Calendar of the State Papers, Relating to Ireland, of the Reigns of Henry VIII, Edward VI, Mary, and Elizabeth*, 204–10; and Thomas, "Siege of Enniskillen Castle, 1594."
[31] Hamilton, *Calendar of the State Papers, Relating to Ireland, of the Reigns of Henry VIII, Edward VI, Mary, and Elizabeth,* 210; and Thomas, "Siege of Enniskillen Castle, 1594."
[32] Hamilton, *Calendar of the State Papers, Relating to Ireland, of the Reigns of Henry VIII, Edward VI, Mary, and Elizabeth*, 210.
[33] Hamilton, *Calendar of the State Papers, Relating to Ireland, of the Reigns of Henry VIII, Edward VI, Mary, and Elizabeth*, 208.
[34] James O'Neill, "Death in the Lakelands: Tyrone's Proxy War, 1593–4," *History Ireland* 23, no. 2 (March/April 2015): 14–17.

English operations at Enniskillen demonstrated the value of coordinated waterborne and land-based forces—not on the grand scale of a World War II D-Day style invasion, but at the tactical level. Having the flexibility to envelop—on land and on the water—the castle prevented the defenders from concentrating on one threat vector. Coordinated operations across both land and water after the arrival of the landing force provided the English commander with the flexibility to control the tempo of the assault.

The advent of airpower, including vertical lift and aerial assault capability, may cause some to argue that the inland land-water interface is no longer pertinent. We can put Marines in helicopters or tilt-rotor aircraft, and they can bypass the land-water interface and go straight to the objective. That may be true, but it is not always an option, especially when the MLR operates as a stand-in force in an air-denied environment. The modern Marine commander needs options, so restoring and expanding a riverine capability to the Marine Corps, specifically in the MLR, is essential to providing flexibility to our Marines. As a stand-in force, the MLR must be able to operate across all domains in the littorals—including the land-water interface.

Conclusion

During the Nine Years' War, English operations in Ireland were the most effective English amphibious operations of the era. This effectiveness resulted from several factors, including the geography of Ireland, the early recognition by the English that amphibious operations were necessary, the Irish tendency to eschew an active defensive position and instead hole up in their fortified keeps, and the English use of mobility and firepower to overwhelm the Irish defenses. Most critical of these were the riverine and lacustrine features of Ireland. Pioneers in Hibernian amphibious operations such as Captain Dowdall recognized the ineffectiveness of land operations in this environment and adopted tactics to take advantage of the mobility provided by the waterways. Dowdall's combined operations to invest, besiege, and then take Enniskillen Castle by an assault from the river exemplify these operations. Identifying and overcoming the Irish defensive structures like sconces and water obstacles meant to impede boat movement, the English were then able to lay siege and storm the weakened castles and eventually quell the rebellious lords of Ireland.

Dowdall adjusted his tactics to the geography in which he fought, and he adapted the tools at his disposal to take advantage of that geography. Today's Marine commanders should take their cue from Dowdall in understanding the riverine and lacustrine operating environment and be prepared to adapt their tactics to match the environment. Adapting to the operating environment is not a new idea. But considering examples such as the siege at Enniskillen Castle allows commanders to equip MLRs with the tools to operate in the riverine and lacustrine environments that permeate the western Pacific littorals in advance of need. However, MLR commanders should also be prepared to adapt indigenous tools, often designed over centuries to operate in the local environment, to maximize MLR effectiveness in the riverine and lacustrine settings they can expect to face.

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The 4th Tank Battalion in the Pacific

A CASE STUDY IN FIELD-INSPIRED INGENUITY

By Robert P. Wettemann Jr., PhD

Abstract: Using the 4th Tank Battalion as a case study, this article argues that U.S. Marine tankers in World War II possessed a uniquely American mechanical aptitude that allowed them to make necessary modifications to their tanks that were crucial to combat effectiveness in the Pacific. Having grown up during the Great Depression and possessing a "use it up, wear it out, make it do, or do without," mentality, these tankers recognized what could be done to improve their tanks, and applying American ingenuity, fabricated armor and tank-to-infantry communications systems, among other innovations to enhance their abilities as warfighters. While this trait was not necessarily unique to the 4th Tank Battalion, their leaders, Captain Robert M. Neiman and Lieutenant Henry L. Bellmon in particular, encouraged such activity, and the battalion was certainly among the most mechanically creative among the Marine tank battalions in the Pacific.
Keywords: 4th Marine Tank Battalion, tanks, ingenuity, armor, Robert M. Neiman, Henry L. Bellmon

In the closing pages of General George S. Patton's *War as I Knew It*, the foremost practitioner of armored warfare in World War II offered this observation on the subject of American ingenuity:

> The Americans . . . are the foremost mechanics in the world. America, as a nation, has the greatest ability for the mass production of machines. It therefore behooves us to devise methods of war which exploit our inherent superiority.[1]

Although Patton had little, if any, direct contact with the U.S. Marine Corps during a distinguished career that culminated in leading the Third Army in defeating Germany, his characterization of the American soldier could also be applied to many Marine tankers who fought against the Japanese in the Pacific. With a reputation as "incorrigible tinkerers, constantly making changes to their tanks that they hoped would make life easier or help increase their chances of survival in combat," Marine tankers, and especially those of the 4th Tank Battalion, repeatedly demonstrated a uniquely American brand of ingenuity as they constantly modified the tanks they employed in the Marshall Islands, on Saipan and Tinian, and on Iwo Jima.[2] Using the 4th Tank Battalion as a case study, this article seeks to show that Marines—encouraged by the forward-thinking leadership of Captain Robert M. Neiman and inspired by men such as Lieutenant Henry L. Bellmon and Gunnery Sergeant Samuel D.

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[1] George S. Patton Jr., ann. Colonel Paul D. Hankins, *War as I Knew It* (Boston, MA: Houghton Mifflin, 1947), 366.

[2] Oscar E. Gilbert, *Tanks in Hell: A Marine Corps Tank Company on Tarawa* (Philadelphia: Casemate, 2015), 63.

Johnston—repeatedly embraced the Great Depression-era adage of "use it up, wear it out, make it do, or do without," and employed their ingenuity, born of necessity, to improve their tanks and counter the challenges presented by a determined enemy. Having grown up in the nation's farms and factories, the men of the 4th Tank Battalion possessed an American mechanical spirit that emanated "from the bottom up," a trait that they demonstrated throughout the war against the Japanese in the Pacific.

A Unique Cultural Context

The 4th Tank Battalion Marines during the Second World War were products of a unique moment in time. While some may regard General Patton's comments praising America's mechanical aptitude as hyperbole, the Americans who fought in World War II were the first generation to reach maturity in the United States with widespread access to the internal combustion engine. As the war began, they owned or operated these machines at a higher per capita rate than the rest of the Axis and Allied nations combined, and did so in a society that emphasized free thinking and problem solving as the "American Way."[3] As U.S. Army chief of staff George C. Marshall recognized in 1939, "Almost every boy in this country knows how to handle a motor vehicle, and many of them understand a great deal about the repair of motor equipment."[4] The erstwhile civilians of the war against the Japanese in the Pacific had spent their youths devouring such book series as *Tom Swift* and *The Hardy Boys* and periodicals such as *Popular Science* and *Popular Mechanics*. Such publications extolled the virtues of the machine in a manner appealing to young boys and lauded a mechanic's ability to tinker with, repair, and improve on whatever technology was available to them.[5] The result was a special brand of skill with machinery, which, after the attack on Pearl Harbor, became part of the American military arsenal as the United States went to war in the Pacific.

Table 1. World per capita automobile ownership, 1939

Country	Cars per 1000 people
United States	227
United Kingdom	54
France	51
Germany	25
Italy	11
U.S.S.R.	5

Source: Table 1.1, in Bernhard R. Kroener, Rolf–Deiter Muller, Hans Umbreit, Das Deutsche Reich und der Zweite Weltkrieg: Organisation und Mobilisierung des Deutschen Machtbereichs, *2 vols. (Stuttgart: Deutsche Verlags-Anstalt, 1988), 1: 651.*

Marine Armor in the Opening Campaigns

On 7 December 1933, *Naval Department General Order No. 241* created the Fleet Marine Force (FMF), task-

[3] These notions are explored in greater detail by Victor Davis Hanson in *The Second World Wars: How the First Global Conflict Was Fought and Won* (New York: Basic Books, 2017), 224. Statistics maintained by the League of Nations in 1939 established U.S. automobile production levels at more than 2,656,000 annually. This production far outstripped production of the other major powers: Germany—342,000; France—223,000; USSR—215,000; Italy—69,000; and Japan—30,000. These statistics combine production of passenger cars with production of lorries, omnibuses, and other wheeled transportation, excluding tractors. See *Statistical Year-Book of the League of Nations, 1938–39* (Geneva: League of Nations, Economic Intelligence Service, 1939), 197; and David M. Kennedy, *Freedom from Fear: The American People in Depression and War, 1929–1945* (New York: Oxford University Press, 1999), 617.

[4] "Emergency Supplemental Appropriation Bill for 1940, Hearings before the Subcommittee of the Committee on Appropriations," House of Representatives, 26th Cong., 3d Sess. (Washington, DC: Government Printing Office, 1939), 6–8.

[5] Beginning in 1872, E. L. Youmans began publishing *Popular Science Monthly*, building the magazine's reputation by documenting the great inventions of the day: the telephone, the electric light, the airplane, and the automobile. Thirty years later, his competitor Henry Windsor began publishing *Popular Mechanics*, a magazine dedicated to the wonders of science and technology that would be, as Windsor hoped, "written so you can understand it." By the 1930s, not only had publications like *Popular Science* and *Popular Mechanics* captured the nation's attention, but young boys also had a growing host of adolescent heroes like Tom Swift and the Hardy Boys, who used technological tinkering to great effect in solving their own problems. See Francis J. Molson, "American Technological Fiction for Youth: 1900–1940," in C. W. Sullivan III, ed., *Young Adult Science Fiction* (Westport, CT: Greenwood Press, 1999), 9–10; Arthur Prager, "Bless My Collar Button, if It Isn't TOM SWIFT," *American Heritage* 28 (December 1976), 64–75; Robert Von der Osten, "Four Generations of Tom Swift: Ideology in Juvenile Science Fiction," *Lion and the Unicorn* 28 (April 2004): 268–84; Carol Billman, *The Secret of the Stratemeyer Syndicate: Nancy Drew, the Hardy Boys, and the Million Dollar Factory* (New York: Ungar Publishing, 1986); and Russell Nye, *The Unembarrassed Muse: The Popular Arts in America* (New York: Dial, 1970), 84–85.

ing it with organizing, planning, supporting, and conducting future amphibious operations. The following year, the Marine Corps published the *Tentative Manual of Landing Operations*, defining all aspects of future amphibious operations including command and control, landing area selection, ship-to-shore movement, beachhead landing and defense, aviation and artillery support, logistical support, and the use of tanks in support of landing forces. The *Tentative Manual of Landing Operations* provided only two pages of instruction to guide future Marine tank officers, leading some historians to conclude that the Marines relied on evolving U.S. Army tank doctrine to guide future operations in the Pacific, with the Tarawa debacle prompting a meaningful review of Marine armor doctrine that later produced *Amphibious Operations: Employment of Tanks* in 1946.[6] Others, however, contend that the unique amphibious mission of the Marine Corps, with tank and armor units subordinated to larger Marine divisions, yielded little in the way of unique Marine tank doctrine, as individual tank units developed doctrine independently.[7] Consequently, Marine tank crews received "one-on-one tutelage as individuals within units" or as specialists who "learned their skills in the field, often under fire."[8] With this minimal doctrinal framework, the potential existed for individual commanders to have significant influence over the means by which tanks were employed in the field, something that was certainly the case with the 4th Tank Battalion.

Early Marine landings on Guadalcanal included an armored presence, but tanks had limited influence in the campaign, due largely to the challenges associated with operating in rugged jungle terrain. On Guadalcanal, Companies A and B of the 1st Tank Battalion landed with the two reinforced infantry regiments of the 1st Marine Division on 7 August 1942. As the forces initially faced little enemy resistance, the tanks became a division reserve, directed by General Alexander A. Vandegrift. Major Francis Cooper of Company B reported that from their landing until reassignment in November 1943, Marine armor was only employed against the enemy three times. In the first instance, a five-tank platoon successfully supported infantry in the final stages of fighting along the Tenaru River in August, attacking enemy machine-gun and mortar positions by crushing the dug-in enemy under their treads. The next day, tanks provided a "morale factor" for Marines mopping up the Japanese that had escaped from the previous day's fighting. In September, Cooper characterized the employment of six tanks in support of 3d Battalion, 1st Marines, along Edson's Ridge as "quite disastrous," as enemy fire knocked out three tanks in a short engagement. In this loss, Cooper identified numerous "costly" lessons, notably the tank commanders' minimal visibility, their preoccupation in directing drivers in the jungle environment, and poor reconnaissance in advance of movement over difficult terrain. Thus, the prospect of continued employment of tanks in tropical areas appeared "very limited."[9]

Even less favorable was the employment of I Marine Amphibious Corps' (IMAC) tank battalion in support of Operation Galvanic, the November 1943 seizure of Betio in the Gilbert Islands. The initial landing craft carrying Major General Julian C. Smith's 2d Marines got hung up on a coral reef, forcing some troops to wade nearly 500 yards to the landing beaches, while others were shuttled between

[6] *Tentative Manual of Landing Operations* (Washington, DC: Headquarters Marine Corps, 1934), paragraphs 2-1000–6; and Joseph DiDomenico, "The U.S. Army's Influence on Marine Corps Tank Doctrine," *Marine Corps History* 4, no. 1 (Summer 2018): 26, 41.

[7] Kenneth W. Estes, "The U.S. Marine Corps Tank Doctrine, 1920–50," *Marine Corps History* 6, no. 2 (Winter 2020): 45–46, 54, https://doi.org/10.35318/mch.2020060203.

[8] Oscar E. Gilbert, *Marine Tank Battles in the Pacific* (Boston: Da Capo Press, 2001), 16; and Allan R. Millett, *Semper Fidelis: The History of the United States Marine Corps*, rev. and exp. ed. (New York: Free Press, 1991), 361.

[9] Major F. H. Cooper, "Notes on the Operations of Tanks (Light) in the Solomons," in Col B. Q. Jones, "Interviews and Statements by Officers of the First Marine Division on the Guadalcanal Operations," 5 December 1942–19 January 1943, World War II Operational Documents, Ike Skelton Combined Arms Research Library Digital Library. See also John L. Zimmerman, *The Guadalcanal Campaign* (Washington, DC: History Division, Headquarters Marine Corps, 1949), 69, 89–80. Kevin C. Holzimmer makes a case for armor effectiveness in latter stages of the Pacific campaign in New Guinea, in "In Close Country: World War II American Armor Tactics in the Jungles of the Southwest Pacific," *Armor* 106 (July–August 1997): 21–26; but Joseph DiDomenico noted that during the testing period of 1941–43, "Armor played a limited role in the overall success of the Guadalcanal campaign because of the restricted jungle terrain." DiDomenico, "The U.S. Army's Influence on Marine Corps Tanks Doctrine," 30.

grounded landing craft and the sea wall in amphibious tractors capable of climbing over the atoll. Enemy fire hit the landing craft carrying IMAC's reconnaissance section, challenging survivors to mark an approach channel for tanks arriving in the fifth wave. Consequently, when company commander First Lieutenant Edward L. Bale ordered his headquarters section and three tank platoons to disembark from their landing crafts, mechanized (LCMs), the surviving members of the reconnaissance section had to expose themselves as they navigated underwater shell craters and guided the tanks to the beach. Lacking fording kits, extended exhaust stacks that allowed for deep-water operations, the Marine M4A2 Sherman tanks could not operate in more than three feet of water.[10] Of the battalion's 14 tanks, only the 2d Platoon tanks *Cobra* and *Conga* and 3d Platoon's *Colorado*, along with *Commando* from the headquarters section, remained operational by midafternoon on 20 November, victims of underwater shell craters or concentrated enemy fire. By the end of the day, only *Cobra* and *Colorado* still functioned, though radio failures hindered their ability to communicate.[11] The next morning, Lieutenant Bale freed the jammed breech block that had rendered 1st Platoon's *China Gal* inoperable, and he remounted it as a command tank, directing fire in support of troops on the western tip of Betio on 22 November.[12] When the Marines reduced the last pocket of Japanese resistance on 23 November, only *Colorado* and *China Gal* remained, though once fighting was over, Bale's Marine tankers, eager to salvage any equipment that could be returned to service, recovered 1st Platoon's *Chicago*, disabled when its electrical system shorted in a submerged shell crater.[13]

Prior to the Gilbert Islands landings, the Marines entertained minimal discussion regarding how tanks should be employed on landfall, making it apparent that a capable commander with vision could dramatically increase the effectiveness of a single tank battalion. Private Joe D. Woolum, gunner aboard 3d Platoon tank *Condor*, regarded the instructions he received in advance of the Betio landings as "asinine," as he was told only to "push across the island as quickly as possible and return, firing only as necessary, turn around, and come back. Then if you happened to see something, shoot it."[14] Furthermore, a classified report entitled "Amphibious Operations During the Period August to December 1943" failed to address doctrine in a meaningful way, elevating the importance of a forward-thinking commander largely through omission. In a discussion of landing operations in the Gilbert Islands, the Mediterranean theater, and the South and Southwest Pacific, medium tanks are mentioned in support of amphibious landings, with no specific mention of the challenges encountered on Betio, particularly with respect to intertank communication, amphibious armored doctrine, or tank-infantry coordination once tanks were ashore. Instead, the report emphasized the importance of amphibian tractors over traditional landing craft, noting that tracked vehicles "though unarmored, proved invaluable for landing troops and supplies, for tearing out wire and log barricades, for dragging drowned trucks ashore, and for towing stranded boats off reefs." Medium tanks were to be used "in accordance with the tactical plan," unique to each invasion situation. The commander of V Amphibious Corps that landed on the Gilberts offered a few specific comments with respect to medium tanks, observing only that "one company of medium tanks supported by turret mount amphibians [amphibious tractors] will be adequate for any one objective island."[15]

[10] Joseph H. Alexander, "Baptism by Fire: Sherman Tanks at Tarawa," *Leatherneck* (November 1993), 34–37; and Gilbert, *Tanks in Hell*, 107–10. The 14 tanks of Bale's Company C all had names that began with the letter C: Bale's own tank was named *Cecilia*, and he was accompanied by his deputy commander aboard *Commando*. 1st Platoon tanks were *Chicago*, *China Gal*, *Count*, and *Cherry*; 2d Platoon tanks were *Cobra*, *Clipper*, *Cuddles*, and *Conga*; and 3d Platoon tanks were *Cannonball*, *Condor*, *Colorado*, and *Charlie*.

[11] Gilbert, *Tanks in Hell*, 125–56.

[12] Gilbert, *Tanks in Hell*, 157–86.

[13] Gilbert, *Tanks in Hell*, 187–91, 195.

[14] As quoted in Gilbert, *Tanks in Hell*, 124.

[15] R. S. Edwards, Chief of Staff, Headquarters of the Commander in Chief, United States Fleet, "Amphibious Operation During the Period August to December 1943," 22 April 1944, World War II Operational Documents, Ike Skelton Combined Arms Research Library Digital Library.

Creating the 4th Tank Battalion

Such were the circumstances faced by Captain Robert M. Neiman, who assumed command of Company C, 4th Tank Battalion, in June 1943. A former life insurance salesman from Maryland, Neiman had joined the Marine Corps in November 1940, graduating from the first Officer Candidates class and serving in the 1st Scout Company before his assignment to the 1st Tank Battalion in April 1942. In November 1942, Neiman chose Camp Elliott, California, home of the Fleet Marine Force Tank School, over aviation school, when Colonel Robert E. Hogaboom promised Neiman that he could have command of the next tank company formed on the West Coast. Moreover, he was told that in forming his new company, he could make by-name selections for the officers and enlisted from those he encountered in the training program.[16]

When 4th Tank Battalion was formed, Neiman's company took on a unique character almost immediately, undoubtedly a product of his being allowed to "handpick the officers and men" for his new company. Selecting the first two platoon leaders from men he knew at the Marine Tank School, Fleet Marine Force Training Command, at Camp Elliott, the third platoon leader he selected was a product of a fortuitous meeting during driving training at Jacque's Farm north of San Diego. As they watched a group of 15 tanks speeding through a training course, one of the tanks "came up fast, spun to a halt, and threw a track." The tank commander of the disabled tank instructed his driver to drive slowly forward and backward, and with two crewmen using hand tools, quickly walked the track back on, allowing the crew to resume training in no time at all. Impressed, Neiman approached the tank commander, asked his name, and demanded an explanation for how he could replace a thrown track so quickly. Second Lieutenant Henry L. Bellmon, the product of a Billings, Oklahoma, wheat farm and recent graduate from Oklahoma A&M College (now Oklahoma State University), quickly replied that he had been around farm equipment since his father had begun replacing horses with Allis-Chalmers tractors in the late 1930s. Recognizing the value of a man who knew his way around machinery, Neiman decided he had found his final platoon leader.[17]

Bellmon joined Neiman in selecting the remaining men in the unit, advising his commander that they should choose personnel who were former members of either the 4-H or Future Farmers of America clubs, as that would "bring in the farm boys who could probably maintain and operate mechanical equipment with a minimum of problems." According to Bellmon, this became one of the criteria for future manpower selections to the company, a decision that eventually yielded remarkable results.[18] Although Neiman's Company C, 4th Tank Battalion, would not be the first or the last Marine tank battalion raised for service in the Pacific, the manpower choices inspired by Bellmon's comments, coupled with 4th Tank Battalion commander Major Richard K. Schmidt's decision to allow company commanders latitude to run their individual companies as they saw fit, produced notable results, particularly with respect to field ingenuity.[19]

Theirs was not an easy task, for little in the way of lessons learned had filtered from the early campaigns to the handpicked men of the company.[20] While they did receive diesel-powered M4A2 medium tanks to replace the M5 Stuart light tanks they had trained on at Jacques's Farm, it was difficult to convince the 23d Marine Regiment commander, Colonel Louis R.

[16] Robert M. Neiman and Kenneth W. Estes, *Tanks on the Beaches: A Marine Tanker in the Pacific War* (College Station: Texas A&M University Press, 2003), 16–17, 32–33, 51–52. Although he never spoke with him, Neiman recalled seeing Gen Patton while the latter was commanding the 2d Armored Division in the General Headquarters Maneuvers in 1941. Neiman and another lieutenant had been assigned as observers to an Army mechanized cavalry regiment and saw Patton while his regiment had set up an ambush for elements of Patton's unit when it attacked a trestle bridge.

[17] Neiman and Estes, *Tanks on the Beaches*, 51–67, 62; Henry Bellmon, with Pat Bellmon, *The Life and Times of Henry Bellmon* (Tulsa, OK: Council Oaks Books, 1992), 30–39, 45.

[18] Bellmon, *The Life and Times of Henry Bellmon*, 45.

[19] Neiman and Estes, *Tanks on the Beaches*, 65. In his memoir, Neiman regarded the failure to "coordinate the efforts of all the companies," particularly with respect to procedures and techniques as "a big mistake" (p. 65).

[20] Neiman stressed this point in his first speech before what was then Company A (they became Company C when they traded in their light tanks for the medium M4A2s later that November), stressing that because of their presence in the company, they were "the best of the best, and then said that we would train very hard and become the best tank company in the Marine Corps," Neiman and Estes, *Tanks on the Beaches*, 67.

Jones, of the need for coordination between armor and infantry. For Neiman and his men, training with the recently arrived medium tanks meant emphasizing practical armor operation and tank maintenance, as the Marine tank battalions lacked their own maintenance units.

Ingenuity in the Marshall Islands

In the aftermath of the Tarawa debacle, the Marine Corps developed deep-wading kits to allow tanks to vent their engines in water deeper than three feet. While the Army used experimental kits in the Mediterranean theater in Operation Torch (1942) and Operation Husky (1943), such developments were largely independent of Marine operations in the Pacific.[21] By the time of the Marshall Islands campaign, not only had elements of the Army's 767th Tank Battalion, 7th Infantry Division (destined for landings at Kwajalein), began employing wading stacks, these stacks were also adopted by Neiman's 4th Tank Battalion, tasked with supporting the Marine landings on Roi and Namur.[22]

In addition to the landing stacks provided by the Corps, Neiman's tankers also worked at the platoon level to make a number of unique additions to their tanks in efforts to deter attacks by Japanese infantry. Recognizing the threat posed by Japanese Type 99 magnetic mines, and the Japanese tactic of sticking these mines to the vertical sides of tank hulls, Company C installed 2-inch-thick planks of Douglas fir to the sides of the tanks to reduce their relative magnetism.[23] Neiman reportedly took this idea from First Lieutenant Leo B. Case, who had served with 1st Tank Battalion on Guadalcanal; when Japanese soldiers swarmed the light tanks at that landing and damaged or knocked them out using these weapons, Case realized that the addition of wood planking could deter future attacks, an effort for which he realized considerable success.[24]

Neiman and his tankers followed another suggestion offered by Case, who subsequently became 4th Tank Battalion's operations officer, and Staff Sergeant Gerald L. De Moss, a company communications noncommissioned officer (NCO).[25] Recognizing the challenges posed by tankers operating in a buttoned-up turret, they installed a field telephone handset in a satchel on the right rear fender of each tank and wired it through the engine compartment into the tank's intercom system. This made tank-to-infantry communication possible, as the radio nets normally used by tank and infantry battalions were incompatible.[26]

The confidential report on amphibious operations in the Marshall Islands issued by the U.S. Fleet on 20 May 1944 in the aftermath of combat on Roi and Namur does not specifically mention Company C's innovations, though it repeatedly speaks to the importance of the "tank-infantry" team and the "great neutralization value" gained by tanks and infantry working together.[27] The official report on Japanese defense and battle damage encountered on Marshall Islands is similarly sparse when it comes to comments on tank-infantry coordination. Colonel Claudius H. M. Roberts of the U.S. Army Ordnance Department, in the closing comments of his 57-page report, stated only that "the use of tanks for close support of infantry is invaluable and the medium tank is recommended. If possible, it should be landed with the assault waves and should be capable of firing en route to the beach."[28]

Following the landings at Roi-Namur, the 4th Tank Battalion received new M4A2 medium tanks

[21] Stephen J. Zaloga, *US Amphibious Tanks of World War II* (Oxford, UK: Osprey, 2021), 8–10, 30–36.
[22] *767th Tank Battalion, After Action Report, 1 January through 31 December 1944*, Ike Skelton Combined Arms Research Library Digital Library, 2–6.
[23] *Japanese Tank and Anti-Tank Warfare*, Special Series no. 34 (Washington, DC: Military Intelligence Division, War Department, 1945), 169, 178–95.
[24] Neiman and Estes, *Tanks on the Beaches*, 85.
[25] Neiman and Estes, *Tanks on the Beaches*, 86.
[26] Gilbert elaborates on these challenges extensively in *Tanks in Hell*, 65–72, noting the absence of any practical communication between tanks and infantry on Tarawa. It is not known that the lack of communication on Tarawa contributed to Neiman's decision to install phones on Company C's tanks. It can be inferred that this was a result of dealing with the 23d Marine Regiment at Camp Pendleton in advance of the Kwajalein Atoll operation.
[27] R. S. Edwards, Chief of Staff, Headquarters of the Commander in Chief, United States Fleet, "Amphibious Operations—The Marshall Islands—January–February 1944," World War II Operational Documents, Ike Skelton Combined Arms Research Library Digital Library.
[28] W. D. Mission, "Marshall Islands Japanese Damage and Battle Damage: Comments on Amphibious Operations, 1 March 1944," World War II Operational Documents, Ike Skelton Combined Arms Research Library Digital Library.

to replace those used in the Marshalls. According to Lieutenant Bellmon, these tanks came equipped with the new fording kits that helped the tanks navigate through sea water in depths up to "eight feet for several hundred yards."[29] In addition to these enhancements provided by the Marine Corps, Neiman's tankers, assigned to support landings on Saipan, improved their new medium tanks, making the same sorts of additions to them that they had made prior to the previous operation. In the battalion combat report drafted after the Saipan operation, battalion commander Major R. K. Schmidt noted that "during the period of training allowed this organization following the Roi-Namur operation, and prior to the Saipan Operation" an "improvised tank-infantry telephone was placed on each tank," with additional communication provided between infantry and tank commanders through the employment of "SCR 536 and TCS equipped jeeps [by] the entire battalion."[30] These makeshift tank-infantry phones, "installed in the tanks before embarking for Saipan," provided "a very satisfactory method of tank-infantry coordination."[31] It should be noted that the Marines embarked for Saipan on 30 May 1944, well in advance of the Normandy invasion. Due to their relative isolation halfway across the globe, it would have been impossible for them to know about the Army's efforts to develop effective tank-infantry communication in Normandy, as the Army's use of the EE-8 telephone as a temporary solution to the challenges posed by fighting in the hedgerows of Normandy did not come into being until mid-June 1944 at the earliest.[32]

Record Group (RG) 127, Records of the United States Marine Corps, Still Photographs Division, National Archives and Records Administration (NARA), Washington, DC

Lt Henry Bellmon atop his tank *Calcutta* on Iwo Jima. The modifications made by the 4th Tank Battalion are conspicuous in this photo, and include water tank and spigots, target clock on the wading stack, phone on the rear fender, and up-armoring efforts with wood planking, sandbags, and wire mesh "birdcage" hatch protectors.

The 4th Tank Battalion also received recently developed flamethrower tanks in advance of the Saipan operation. Nicknamed "Ronsons," these tanks mount-

[29] Bellmon, *The Life and Times of Henry Bellmon*, 53.

[30] SCR refers to set, complete radio; TCS refers to tactical communications system.

[31] Maj R. K. Schmidt, Headquarters report, in "Fourth Marine Division Operations Report—Saipan, Annex K, Report of the 4th Tank Battalion," 20 August 1944, 2; and Maj Robert N. Neiman, Company C report, in "Fourth Marine Division Operations Report—Saipan, Annex K, Report of the Tank 4th Tank Battalion," 20 August 1944, both in *Fourth Marine Division Operations Report, 15 June to 9 July 1944*, World War II Operational Documents, Ike Skelton Combined Arms Research Library Digital Library, 32.

[32] For U.S. Army examples of early tank-infantry communications efforts, see "Battle Experiences No. 8, 27 July 1944," in *Battle Experiences July 12, 1944–May 5, 1945* (Headquarters, European Theater of Operations: Combat Lessons Branch, G-3, 1945), 369; and "Immediate Report No. 27 (Combat Experiences), 10 August 1944," in *Immediate Reports of Combat Operations* (Headquarters, European Theater of Operations: Combat Lessons Branch, G-3, 1945), 462, both World War II Operational Documents, Ike Skelton Combined Arms Research Library Digital Library. These suggestions were repeated in "Battle Experiences No. 13, 1 August 1944," which recognized the "success" encountered with linking "a microphone or telephone on the outside of certain tanks connected with the intercommunication system of the tank," and repeated verbatim in "Battle Experiences No. 17, 11 August 1944," in *Battle Experiences July 12, 1944–May 5, 1945*, 351, 359.

Record Group (RG) 127, Records of the United States Marine Corps, Still Photographs Division, National Archives and Records Administration (NARA), Washington, DC

A pair of up-armored Marine tanks equipped with water tanks and infantry radios advancing on a sniper's nest on Saipan, June 1944.

ed a flamethrower in the tube of a light tank and had an effective range of 80–100 yards. These new weapons were not received favorably, and despite sending 2 officers and 20 enlisted men to attend the flamethrower school at Pearl Harbor prior to the operation, they were reported as "unsatisfactory" in the formal operation report submitted 20 August 1944.[33]

In the aftermath of the Saipan operation, other tankers, undoubtedly inspired by Neiman's efforts, equipped their tanks with "[F]rench phones" and improvised handsets made by using "a radio earphone as the receiver and a microphone as the mouthpiece, and taping them together." As before, these were mounted on the left rear fenders of the tanks.[34] These phones enjoyed mixed reviews, no doubt a consequence of how well commanders had familiarized Marine infantry with the new additions. The forward-thinking Neiman specifically noted that the added intercom system worked best when an infantry officer, usually a company commander or executive officer, walked directly behind the control tank, communicating with the tank constantly. In contrast, Company A commander First Lieutenant Stephen Horton Jr. noted in his combat report that while his company had phones installed, "much confusion was encountered due to people that did not know how to operate them."[35]

In addition to the improvised telephones, Company C added supplemental "armor" to their new medium tanks to counter evolving Japanese infantry

[33] Schmidt, Headquarters report, in "Fourth Marine Division Operations Report—Saipan, Annex K, Report of the 4th Tank Battalion," 20 August 1944, 3, 5.

[34] Schmidt, Headquarters report, in "Fourth Marine Division Operations Report—Saipan, Annex K, Report of the 4th Tank Battalion," 20 August 1944, 6.

[35] Neiman, Company C report, in "Fourth Marine Division Operations Report—Saipan, Annex K, Report of the 4th Tank Battalion," 20 August 1944, 32; and 1stLt Stephen Horton Jr., A Company Report, in "Fourth Marine Division Operations Report—Saipan, Annex K, Report of the 4th Tank Battalion," 20 August 1944, *Fourth Marine Division Operations Report, 15 June to 9 July 1944*, World War II Operational Documents, Ike Skelton Combined Arms Research Library Digital Library, 16. In his report, Company B commander 1stLt Roger F. Seasholtz had an intermediate assessment, as he reported that "phones installed on the right grouser box were of great value in co-ordination to both infantry personal [*sic*] and tank reconnassance [*sic*] personel [*sic*]. Roger Seasholtz, Company B report, in "Fourth Marine Division Operations Report—Saipan, Annex K, Report of the 4th Tank Battalion," 20 August 1944, *Fourth Marine Division Operations Report, 15 June to 9 July 1944*, World War II Operational Documents, Ike Skelton Combined Arms Research Library Digital Library, 28.

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A battle-scarred *Davy Jones* reloads ammunition on 22 February. Note the welded spikes protecting hatches and vents.

tactics, layering sandbags over the rear engine compartment to protect against satchel charges hurled onto vulnerable vents and hatches by Japanese troops. They also covered "all possible hull armor" with one-inch lumber planks, but quickly realized that in leaving one-inch air space between the lumber and the hull, they had formed "perfect forms for pouring reinforced concrete" and subsequently poured concrete in the space to further protect the hull.[36] Only the tanks of Neiman's Company C received these additions, though by the end of the campaign, First Lieutenant Roger F. Seasholtz, commanding Company B, realized the value of this protective space above the tank's hull to deter the impact of magnetic antitank (AT) mines. Noting that the "magnetic anti-tank mine was effective when thrown or placed on top of the tank" and that such weapons were capable of blowing a hole in the armor plate, he suggested the addition of "chicken wire, metal strips or wood." He professed that the addition of space between the mine and the tank hull would "greatly reduce the shock of a magnetic AT mine explosion," stating the desire to test such arrangements when the time and situation permitted.[37] In the ensuing operation on Tinian, which had "much more suitable tank terrain" compared to Saipan, not only did the tanks of 4th Tank Battalion encounter "little trouble" in the operation, but First Lieutenant Stephen Horton, Company A commander, realized

[36] Schmidt, Headquarters report, in "Fourth Marine Division Operations Report—Saipan, Annex K, Report of the 4th Tank Battalion," 20 August 1944, 6; and Neiman and Estes, *Tanks on the Beaches*, 93–94.

[37] Seasholtz, Company B report, in "Fourth Marine Division Operations Report—Saipan, Annex K, Report of the 4th Tank Battalion," 20 August 1944, 29.

that "flat surfaces of the tank covered with wood and pouring sand in between the wood and armor plate should neutralize the magnetic mine, as well as minimize the effect of anti-tank fire," as the Japanese also employed 47-mm antitank weapons against the Marine tanks. Furthermore, "special attention should be paid to the hatches in protection against magnetic mines," as the Japanese had come to embrace attacking those potential weak points as an antitank tactic.[38]

Neiman also specifically mentioned another improvement made by Company C: the addition of an extended periscope made to improve a tank commander's vision. Lengthening a standard periscope by cutting one in half and inserting a periscope base between the two halves, then "welding the three pieces together" gave the tank commander the ability to see the ground directly in front of the tank, something that was not normally possible. To protect this contrivance, the tankers added an armored cage to protect the longer periscope.[39] In addition to these crew-developed improvements, each platoon in Neiman's company received a medium M4 tank mounting a flamethrower, weapons that were products of a Joint Army, Navy, and Marine Corps effort.

Preparations for Iwo Jima

In the aftermath of Saipan and the "perfect landing" at Tinian, the Marines of the 4th Tank Battalion returned to Hawaii to recuperate prior to the invasion of Iwo Jima.[40] While engaging in a battalion-wide refit, Neiman's tankers discovered an issue of the *Armored Force Journal* or *Infantry Journal*, describing the antimine "flail" tanks originally developed by the British and used for mine-clearing operations. Recognizing the potential for such apparatus but knowing that none existed within the Marine Corps, Neiman and his officers decided to build one from scratch. Neiman singled out two of his NCOs, Sergeants Sam Johnston and Ray Shaw, as instrumental in the tank's construction. Bellmon provided insight into Johnston's background, which is illustrative of the character of the Company C tankers and why they appear to be at the forefront of Marine armor innovation in the Pacific. Bellmon lauded the mechanical ability of fellow Oklahoman Johnston, who "had worked as an oil field roughneck and driller" prior to joining the Marine Corps. To build the mine-clearing tank, Johnston salvaged a dozer tank and replaced the dozer blade with a flail. Using "the drive shaft and differential of an abandoned truck" with heavy chain attached to a rotating drum, they transferred power from the tank drive shaft via a transmission stripped from a jeep. After a successful test, Neiman subsequently assigned the tank to Bellmon's 2d Platoon for the Iwo Jima invasion.[41]

The 4th Tank Battalion received new tanks in advance of the Iwo Jima landings, turning in the M4A2 mediums, powered by twin diesel engines, for the recently developed M4A3 Sherman model with a single Ford gasoline engine. This led to new names for the individual tanks in Bellmon's platoon, as he gave up

[38] Maj R. K. Schmidt, Headquarters report, in "Fourth Marine Division Operations Report—Tinian, Annex K, Report of the 4th Tank Battalion," 22 August 1944, 5; and 1stLt Stephen Horton Jr., Company A report, in "Fourth Marine Division Operations Report—Tinian, Annex K, Report of the 4th Tank Battalion," 22 August 1944, 11, both in *Fourth Marine Division Operations Report Tinian, 24 July 1 August 1944*, World War II Operational Documents, Ike Skelton Combined Arms Research Library Digital Library.

[39] Neiman, Company C report, in "Fourth Marine Division Operations Report—Saipan, Annex K, Report of the 4th Tank Battalion," 20 August 1944, 34.

[40] Neiman and Estes, *Tanks on the Beaches*, 112.

[41] Neiman and Estes, *Tanks on the Beaches*, 113–17, 119; and Bellmon, *The Life and Times of Henry Bellmon*, 60–61. Bellmon was somewhat critical of his commander in the creation of the ersatz flail, as he noted that "Captain Bob was much taken by this device and bragged about it at every opportunity. Finally, word reached the commanding general who insisted on seeing the machine so he could decide whether or not it might be applicable for use in other war theaters. On the day of the general's inspection, Captain Bob took the general in tow, took full credit for the idea and construction, and received the general's congratulations. The captain never once mentioned Sam's name or even bothered to introduce Sam to the General or his party." Orders note the presence of the 127th Naval Construction Battalion on Maui during the same period as the 4th Tank Battalion. *127th Naval Construction Battalion, Historical Information*, Naval History and Heritage Command, accessed 10 April 2023, 1. The concluding pages of their historical information includes a photograph of the same Sherman flail tank reportedly built by Neiman's Marines, making it altogether unclear as to which unit played the greatest role in its construction, though R. P. Hunnicutt offers the same illustration and notes that the flail was "constructed by the Seabees for the U.S. Marines." R. P. Hunnicutt, *Sherman: A History of the American Medium Tank* (Stamford, CT: Historical Archive Press, 1994), 463.

his tank *Jezebel* for a new one he christened *Cairo*.[42] Neiman quickly noted that his Marine tankers "applied all of our usual modifications to the new tanks before embarking."[43] The result represented the pinnacle in Marine field expedient ingenuity during the Central Pacific campaign, with Company C in the vanguard, making additions to their tanks that other company commanders did not embrace. Company C took specific measures to support the infantry that would accompanying them. Neiman located a number of spare gasoline tanks designed for light tanks, cleaned them, and bolted them to the rear deck of 21 of the company's medium tanks. With bungs and spigots on each end, they would be used as supplemental water tanks for Marines on foot, an essential addition in the tropical conditions they would face in subsequent campaigns.[44]

Company C also improvised a method for fire direction that could be used by Marine infantry outside the tank. They painted a clock face on the side of the wading stack closest to the telephone with the simple statement "TARGET CLOCK" above the images. This allowed any Marine to approach the tank, pick up the phone, and ask for suppressing fire at the appropriate direction by simply stating the appropriate time.[45] It should be noted, however, that while Neiman described these additions, he did specifically state that the tank-infantry telephone, which other companies eventually picked up on, was the only additional modification embraced by other companies of 4th Tank Battalion.[46]

In advance of the landings on Iwo Jima, the 4th Tank Battalion also received additional flamethrowing tanks, much improved from the Ronsons they had employed earlier. Neiman reported their development as a product of a Joint Army, Navy, and Marine Corps effort on Hawaii, which allowed the employment of a heavier flamethrower in a medium tank. Holding 290 gallons of fuel in a reservoir mounted below the tank's turret basket, the 4th Tank Battalion had eight of these tanks as they embarked for Iwo Jima.[47] They became "probably the most valuable single weapon employed on Iwo Jima in spite of considerable mechanical failures," with the ability to maintain them during the course of the operation yet another testament to the mechanical acumen of the Marine tankers.[48]

The after action report of the 4th Tank Battalion offers a complete list of modifications made by the tankers of Neiman's company. His Marines started by welding spare track block to the turrets and front slope plates as added protection against fire from both 47-mm guns and shaped charges. Fifty-four tanks had 1.5-inch wire mesh welded over the tops of all hatches, creating what the Marines had come to call "birdcages" that provided space to dissipate the blast of satchel charge. In 45 tanks, the crews replaced the 75-mm ammunition ready box on the floor of the turret with a 75-mm ready rack that allowed each tank to carry 25 additional rounds of ammunition. Ten tanks had their vision cupolas rotated 45 degrees clockwise, allowing the hatch to open to the rear rather than the right side, to keep "branches, wire, etc., from hitting the hatch," a modification they recommended "should be incorporated in all tanks." Thirty-four others had several pieces of one-inch rod welded perpendicularly to the front slope plate to allow the towing cable to be stored in a more readily accessible position. Sixteen tanks had the commander's periscope lengthened to provide better vision, and 18 tanks had their deck escape hatch modified by cutting it in half, hinging it

[42] Neiman and Estes, *Tanks on the Beaches*, 119; and Henry Bellmon to Parents, 18 November 1944, file 7, box 1, Correspondence, September 1943 to 23 November 1944, Henry Bellmon Papers, Special Collections and Archives, Edmon Low Library, Oklahoma State University, Stillwater, OK.

[43] Neiman and Estes, *Tanks on the Beaches*, 119.

[44] Neiman and Estes, *Tanks on the Beaches*, 119.

[45] These additions prior to Roi-Namur are explicitly described by Neiman and Estes, *Tanks on the Beaches*, 85–86.

[46] Neiman and Estes, *Tanks on the Beaches*, 85.

[47] Neiman and Estes, *Tanks on the Beaches*, 120; *Flame!*, Special Technical Intelligence Bulletin no. 9 (Washington, DC: Office, Director of Intelligence, Army Service Forces, War Department General Staff, 1945), 9–10, World War II Operational Documents, Ike Skelton Combined Arms Research Library Digital Library; Patrick J. Donahoe, "Flamethrower Tanks on Okinawa," *Armor* 103 (January–February 1994): 6–10; and Steven J. Zaloga, *U.S. Marine Corps Tanks of World War II* (Oxford, UK: Osprey, 2012), 18–20.

[48] "Annex Jig to Fourth Marine Division Operations Report, Iwo Jima, Fourth Tank Battalion Report," 18 April 1945, World War II Operational Documents, Ike Skelton Combined Arms Research Library Digital Library, 21.

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Another 4th Tank Battalion tank, *Comet*, with crew resting on the edge of the island's first airstrip, 23 February 1945. Note the welded track block as supplemental armor on the front glacis plate, and extensive use of "birdcage" protection applied to all hatches and vents.

to the deck armor, and securing it from inside. A cover and hatch were constructed for the two otherwise open-topped M32B3 armored recovery vehicles to protect their crews from small arms fire. Collectively, these additions represented the high point of Marine modifications to the M4A3 medium tanks made during World War II.[49]

While the innovations in the 4th Tank Battalion seemed to be applied to all the tanks in the unit prior to the Iwo Jima landings, other battalions were not as systematic, though they embraced the same sort of bottom-up ingenuity and attempted solutions of their own. Tankers of the 5th Tank Battalion secured a "small amount of sheet metal" and used it to cover the tank sponsons, with other tanks using wooden planking and additional track blocks on the hull and turrets in a manner not unlike that of 4th Tank Battalion. In lieu of the battalion's birdcages, 5th Tank Battalion used 16-penny nails welded point up in a 2-inch square pattern as well as various patterns of wire netting over hatch and periscope covers. Collectively, these provided a four-inch blast space as well as complicated the enemy's ability to pry open hatches. The Marines also affixed wire mesh atop the fording adaptor to prevent grenades from being dropped into the exhaust system,

[49] "Annex Jig to Fourth Marine Division Operations Report, Iwo Jima, Fourth Tank Battalion Report," 15–17.

Record Group (RG) 127, Records of the United States Marine Corps, Still Photographs Division, National Archives and Records Administration (NARA), Washington, DC

By the time of the Okinawa campaign, other tank battalions had followed the lead of 4th Tank Battalion, and had applied supplemental armor to their tanks. Taken near Naha, Okinawa, May 1945.

layered sandbags over the engine compartments, and mounted spare bogies on the tank bustles in an effort to thwart magnetic mines and satchel charges.[50] The 3d Tank Battalion was even less systematic in their efforts, as their commander, undoubtedly influenced by what he saw on the other two battalions when they were brigaded together in a single unit, wrote in his after action report that in future operations "it will be necessary to immediately devise increased armor protection for the M4A2 Medium tank (i.e., additional spaced armor, welded track blocks)," even going so far as to recommend white asbestos in the fighting compartment to reduce the fire hazard.[51]

Marine armor reached the zenith of its overall performance during the Iwo Jima campaign. The 4th Tank Battalion performed admirably, with Lieu-

[50] "Annex Love, Fifth Tank Battalion, Action Report," in *Fifth Marine Division (Reinforced), Action Report, 19 February to 26 March 1945*, part 5, World War II Operational Documents, Ike Skelton Combined Arms Research Library Digital Library, 2–3.

[51] "Enclosure H, 3d Tank Battalion, Action Report," in *Third Marine Division, Iwo Jima Action Report, 31 October to 16 March 1945*, part 17, World War II Operational Documents, Ike Skelton Combined Arms Research Library Digital Library, 31.

tenant Bellmon earning a Silver Star for "conspicuous gallantry and intrepidity" during the course of the campaign. Shortly after landing, a Japanese mine damaged his tank, and he remained with the stricken vehicle, maintaining fire control and further directing his company. Leading his platoon through a heavily mined area the next day, his tank was immobilized "far beyond friendly lines," and he abandoned it and returned to take command. Mounting a new tank the next day, he led his platoon in continued attacks until his new tank was hit by an antitank projectile that killed a number of his crew. Undeterred, he commandeered another tank and continued the attack until the enemy position was reduced.[52] In the latter stages of the battle, Bellmon remained in action, joining elements of the 3d, 4th, and 5th Tank Battalions as part of a single armored phalanx led by Lieutenant William R. Collins of the 5th Tank Battalion, with 4th Tank Battalion's Major Neiman serving as executive officer.[53]

These efforts notwithstanding, the battle was costly for 4th Tank Battalion, as only nine tanks remained operational by the end of the campaign.[54] Although Neiman originally believed that the battalion's fabricated flail tank had bogged down and failed to perform, that was not the case. According to tank commander Sergeant Robert Haddix, the tank made it off the beach and as far as the first airfield, where it encountered a series of flags. Though the tankers initially believe that the flags marked the edges of a minefield, they were in fact range-finding flags for Japanese heavy mortars. When heavy enemy fire damaged the flail mechanism, Haddix and his crew had no choice but to abandon their tank, and consequently, they never had the opportunity to test its functionality.[55]

Iwo Jima marked the end of combat operations for the 4th Tank Battalion, though it did not mark the end of comparable Marine tank modifications in the Pacific. In the battle for Okinawa, the 1st and 6th Marine Divisions formed part of Lieutenant General Simon B. Buckner Jr.'s Tenth Army, with the 2d Marine Division serving as a floating reserve. As part of the 1st Marine Division, the 1st Tank Battalion made a number of "special preparations" in advance of the operation, additions that echoed the innovations developed by 4th Tank Battalion during the course of its campaigns across the Pacific. Specifically, 1st Tank Battalion tanks had sections of track block "spot-welded around the turret and front slope plate" and beach matting welded on tank sponsons "as protection against magnetic mines and AT grenades," with additional plate added to cover all spoke-type bogie wheels and rear idlers.[56] Additionally, 1st Tank Battalion improved tank-infantry communication by improvising phone boxes and welding them on the left rear sponson of all tanks.[57] The 6th Tank Battalion followed suit, adding tank-infantry radios, with sections of steel track blocks added to the turrets of tanks and additional steel plate welded to cover portions of the sponsons and track. As they were unable to procure enough armor plate to cover the entire sponson, extra protection spaced from the main hull by a distance of "about one inch" was only added to the areas opposite the driver, assistant driver, and gasoline tanks.[58] Army tankers also tested what they called a "backscratcher," attaching antipersonnel mines on the sides of tank turrets and detonating them when threatened by Japanese soldiers wielding satchel charges. Such efforts were eventually disap-

[52] 1stLt Henry L. Bellmon, Silver Star citation, USMC Silver Star Citations WWII (B) PDF, "USMC WWII Silver Star Citations," Headquarters Marine Corps, 125, accessed 11 April 2023. Surprisingly, Neiman makes no mention of this award in his memoir.
[53] Neiman and Estes, *Tanks on the Beaches*, 133.
[54] Neiman and Estes, *Tanks on the Beaches*, 138.
[55] Neiman and Estes, *Tanks on the Beaches*, 126.
[56] Such efforts had apparently been undertaken since Guadalcanal. There, a Seabee machinist, recognizing how a Japanese soldier immobilize a tank by thrusting a metal bar into its open drive sprocket, cut the top off a 55-gallon drum and welded it over the sprocket, all the while muttering how he had to "protect those helpless Marines," as described in William Bradford Huie, *Can-Do: The Story of the Seabees* (New York: E. P. Dutton, 1944), 180.
[57] "Tank Annex: Special Action Report Nansei Shoto, Phase III," *First Marine Division (Rein), Special Action Report, Nansei-Shoto Operation, 1 April–30 June 1945*, part 3, World War II Operational Documents, Ike Skelton Combined Arms Library Digital Library, 198.
[58] "Annex E-Sixth Tank Battalion Report," *Sixth Marine Division, Special Action Report on Okinawa Operations*, 2 vols., 719, box 8, folder 2, World War Two/Okinawa, Collection 3720, Archives Branch, Marine Corps History Division, Quantico, VA.

proved by General Joseph W. Stilwell.[59] With these additions, the 1st Tank Battalion listed 79 tanks damaged, with 27 as "totally lost," while the Japanese knocked out 51 of 6th Tank Battalion's Sherman tanks in the fight for Okinawa, though the number of tanks actually damaged in combat was much higher, with Marine maintenance crews returning many to battle before the island was considered secure.[60]

Conclusion

The Marines of 4th Tank Battalion were not the only ones to demonstrate a brand of bottom-up ingenuity to face the challenges posed by Japanese troops in the Pacific. By Operation Iceberg (1945), the invasion of Okinawa, both the veteran 1st Tank Battalion and untested 6th Tank Battalion had added spare track blocks to the hulls and turrets of their tanks as supplemental armor. By the end of the campaign, these improvements, coupled with the addition of infantry radios, wooden slats, and metal shields to hinder Japanese efforts to throw satchel charges under tank treads represented individual efforts devised at the unit level as a way of coping with many of the same problems faced by Neiman, Bellmon, and the tankers of the 4th Tank Battalion on Roi-Namur, Saipan, and Iwo Jima.[61]

By emphasizing Marine Corps technical ingenuity in the Pacific during World War II, the connection between Depression-era mechanical familiarity and prowess from the platoon level up is perhaps most manifest. When comparing the innovative capabilities of the various Marine tank battalions, 4th Tank Battalion, made up of men like former farm boy Lieutenant Bellmon and oil-field roughneck Sergeant Johnston, led the way in contributing to the Marine reputation of scrounging whatever material was needed to make something of almost nothing, adding field expedient armor, communications instruments, and logistical additions to improve their chances of operational success on the battlefield.[62] Although Marine tankers in other battalions practiced mechanical ingenuity, the members of the 4th Tank Battalion elevated their technical creativity to a higher level. In that sense, they ably demonstrated the traits of the American soldier as recognized by Eisenhower in his memoir of the war in Europe. There were few military commanders who understood the American fighting man as well as Eisenhower, and his words, like those of Patton's, could have applied to Neiman, Bellmon, and Johnston when the Supreme Allied Commander observed:

> The trained American possesses qualities that are almost unique. Because of his initiative and resourcefulness, his adaptability to change and his readiness to resort to expedient, he becomes, when he has attained a proficiency in all the normal techniques of battle, a most formidable soldier.[63]

Such a characterization was certainly true of the 4th Tank Battalion.

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[59] Nicholas Evan Sarantakes, ed., *Seven Stars: The Okinawa Battle Diaries of Simon Bolivar Buckner, Jr., and Joseph Stilwell* (College Station: Texas A&M University Press, 2004), 97–98.
[60] "Tank Support Annex: Special Action Report Nansei Shoto," *First Marine Division (reinforced), Special Action Report, Nansei Shoto Operation, 1 April–30 June 1945*, 240; and "Annex E-Sixth Tank Battalion Report," *Sixth Marine Division, Special Action Report on Okinawa Operations.*
[61] Zaloga, *U.S. Marine Corps Tanks of World War II*, 40–45.
[62] Gilbert, *Tanks in Hell*, 63.
[63] Dwight D. Eisenhower, *Crusade in Europe: A Personal Account of World War II* (Garden City, NY: Doubleday, 1948), 453.