LIBERTY UNIVERSITY

We Clear the Way: United States Army Combat Engineers in the Second World War's Southwest Pacific Theater, 1942-1945.

Submitted to Dr. Brian Cervantez

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By

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Abstract

The immense scope and scale of World War II required its combatants to conduct operations in every conceivable climatic condition and topographical setting. This fact has continued to represent a double-edged sword for the historiography of this conflict. The researcher may pursue any number of elements of this war to pursue and have done so. That said, aspects remain not yet mined from the cavernous topographical lode eight decades after this war. One such angle of this war not yet fully researched and analyzed by historians is that of General Douglas MacArthur and the US Army's operational record and experiences in the Southwest Pacific. More specific within this wider consideration is the Army's combat engineers' record and tactical contributions to MacArthur's strategic victory. While authors have often analyzed and critiqued the general himself, that is not the case for the Army at the tactical level, especially in this theater of the war. This work aims to fill only a small portion of that gap by discussing the combat engineers' tactical employment through doctrinal development, evolution, and employment.

Keywords: *MacArthur, Engineers, Pacific, Army, Doctrine, Leadership, Amphibious*

Contents

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Abbreviations and Acronyms

2nd Lt.	Second Lieutenant
AAF	Army Air Forces
Adm.	Admiral
AGCT	Army General Classification Test
AGF	Army Ground Forces
ASF	Army Service Forces
Brig. Gen.	Brigadier General
CINCPAC	Commander-in-Chief, Pacific Fleet
COMINCH	Commander-in-Chief, United States Fleet
CNO	Chief of Naval Operations
Col.	Colonel
COS	Chief of Staff (Army)
Cpt.	Captain
Gen.	General
GHQ	General Headquarters
HQ	Headquarters
IJA	Imperial Japanese Army
IJN	Imperial Japanese Navy
LCM	Landing Craft, Mechanized
LCT	Landing Craft, Tanks
LCVP	Landing Craft, Vehicles, Personnel
LST	Landing Ship, Tanks

LVT	Landing Vehicle, Tracked
Lt. Col.	Lieutenant Colonel
Lt. Gen.	Lieutenant General
Maj.	Major
Maj. Gen.	Major General
OCS	Officer Candidate School
ROTC	Reserve Officer Training Corps
SWPA	Southwest Pacific Area
US	United States

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Chapter I:

The Pacific War, the United States (US) Army, and the Combat Engineers

General (Gen.) Douglas MacArthur and the US Army's Pacific War campaigns against the Imperial Japanese Army (IJA) between 1941 and 1945 presented considerable operational and tactical challenges. Specifically, how could MacArthur tactically overcome the physical challenges to achieve his desired strategic end state? Overcoming these challenges, required the US Army to implement and endure wide-ranging adaptations to training, equipping, leadership, and across war's tactical, operational, and strategic levels. This was especially true of the Army's preeminent combat enabler, the combat engineers. This project scrutinizes how the military evolution within the combat engineers at the operational and tactical levels of war between 1941 and 1945, (as a component of the larger operational organization), made Gen. MacArthur's achievement of his theater-level strategic goals and by default, US national policy aims by attaining victory in the Southwest Pacific Area (SWPA), possible.

Military historical research is broad in methodological application. In recent practice, traditional military narrative perspectives (battle and leader analysis for example) and utilitarianism have shifted to examining military matters and war more from a sociological or anthropological perspective. This method often utilizes war as context or background for the researcher's intended argument, an assessment of war's impact on society, and specific groups within a given society. While such studies add to the research of war in its broader historical relevance, such a methodological approach is insufficient for this study. Therefore, this project

presents the argument for the critical contributions of the Army's combat engineers in the SWPA via a more traditional historical methodology: the threads of continuity.[1]

Threads of continuity, for this study, consists of examining the Army's combat engineers' war experience and changes through the prisms of military theory and doctrine, generalship (and leadership in a broader scope), strategy, tactics, logistics, technology, and economic factors. These seven components represent the bulwark of this study with the remaining three mechanics of application: military professionalism, and political and social factors contributing to ancillary fashion. Such an approach best allows for the proper contextualization of the Pacific War and the United States' strategic situation following Japan's initiation of hostilities in December of 1941, and examination.[2]

The end of resistance on the island of Corregidor (Philippines) and the subsequent surrender of American and Filipino forces on 7 May 1942 was the lowest point in the Pacific War for the United States. By mid-1942, Imperial Japan had secured a considerable empire spanning much of the Asia-Pacific region. The invasion and conquest of the Philippines afforded a degree of security to Japan's lines of communication and supply between the home islands and recently conquered areas in Southeast Asia. These territories represented the lifeblood of their modern military apparatus that characterized the means of securing the empire. Japan, therefore, held the initiative. Meaning that in 1942 they could, and did, dictate when and where to strike next. From the perspective of the IJA, they believed Australia was now open to conquest. They needed a

[1] Lieutenant Colonel (Lt. Col.) John F. Votaw, "An Approach to the Study of Military History," in *A Guide to the Study and Use of Military History*, ed. John E. Jessup Jr. and Robert W. Coakley (Washington, DC: Office of the Chief of Military History, Department of the Army, 1979), 47-48.

[2] Ibid, 47.

land mass close enough to first-stage invasion formations, equipment, and supplies. This location would then serve as the operational headquarters for such an invasion.

On the American side by mid-1942 Gen. MacArthur was himself in Australia and unsure of what was to come next, for him personally and the US Army, operationally, in the Pacific. Japan initially attacked the Philippines in conjunction with their Pearl Harbor air raid the previous December.[3] However, the subsequent invasion and subjugation of the archipelago held greater long-term strategic implications for the US than did the Hawaii assault. As the prominent opening land confrontation between Japan and the US, the Philippine campaign increasingly turned against the American and Filipino defenders. Cognizant of the eventual outcome and concerned with the ramifications of the Japanese capturing MacArthur, President Franklin D. Roosevelt ordered the commanding general out of the archipelago and to Australia to organize and direct the forthcoming US campaigns against Japan.[4]

Two underlying factors dictated the progression of the war on the US side from 1942 forward. The inherent US Army-Navy inter-service rivalry and the latent anger that permeated the United States because of the nefarious manner by which Japan pronounced in December 1941 its decision for war. President Roosevelt and most of his military and naval advisors may have viewed Hitler and Germany as the preeminent tangible threat, but the president could not afford to set aside the Japanese militarists and imperialists until after defeating Germany. Thus, the US was to fight two simultaneous wars in the Europe-Mediterranean and Asia-Pacific regions with the latter naturally being a marine or naval war supplanted by significant aerial operations.

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[3] The air raids on vital American installations throughout the Philippines began approximately 10 hours after the Hawaiian onslaught.

[4] Orders Directing MacArthur to Leave Corregidor, February 23, 1942, The MacArthur Archives, The MacArthur Memorial, http://www.macarthurmemorial.org/DocumentCenter/View/535/Episode-9-Orders-Directing-MacArthur-to-Leave-Corregidor-Page-2-February-23-1942?bidId=

But the defeat of Japan above, upon, and below the surface waters of the Pacific would not compel Japan to capitulate. Japanese military and naval leaders established and continuously fortified what they intended and hoped to be an impregnable defensive perimeter around the home islands and critical territories. This ring consisted of islands or archipelagoes manned by ground troops, with many of these locations also containing airfields and aircraft that threatened future US Navy operations. Therefore, land campaigns were necessary to achieve its national strategic goals in the Pacific War.

The details of how and why the US Army, Navy, and ultimately President Roosevelt could not reach concurrence on a single, unified command for prosecuting the Pacific War is beyond the scope of this dissertation. It is, however, a critical consideration of the Pacific War's broader strategic concerns and the subject of much discourse. That said, for Army Chief of Staff (CoS) Gen. George Marshall and Chief of Naval Operations (CNO) Admiral (Adm.) Ernest King's reasons for presenting their recommendation concerning the eventual Pacific command structure to President Roosevelt is their joint memorandum of March 24, 1942.[5] For an analysis of this consequential matter, see Louis Morton, *United States Army in World War II: The War in the Pacific: Strategy and Command the First Two Years* (1962).[6] With the US Army and Navy determined to have their respective designs for the war against Japan implemented a bifurcation of the US command structure in the Pacific War became the operational reality in April 1942.[7] Adm. Chester Nimitz commander of the US Pacific Fleet since December of 1941 as part of the

[5] Marshall, General George C., and Admiral Ernest J. King, "Memorandum for the President, March 24, 1942," Box 3, Franklin D. Roosevelt: The President's Secretary's File (PSF), 1933-1945, Franklin D. Roosevelt Library & Museum, 2002, https://www.fdrlibrary.marist.edu/_resources/images/psf/psfa0043.pdf.

[6] Louis Morton, *U.S. Army in World War II: The War in the Pacific: Strategy and Command: The First Two Years* (Washington, DC: Office of the Chief of Military History, Department of the Army, 1962), 240-56.

[7] Ibid.

command and staff shake-up in the wake of the Pearl Harbor disaster obtained the additional role and responsibility of commanding the US Navy's portion of the Pacific theater, officially the Pacific Ocean Area (POA). The command's area of operations consisted of an expanse larger than the continental United States with the islands of Micronesia comprising 1,200 square miles (about half the area of Delaware).[8] The remaining two-thirds of the Pacific theater consisted of the China-India-Burma area of operations, and the SWPA with Gen. MacArthur appointed commander of the latter.[9]

The SWPA theatre of the Pacific War consisted of an extensive number of austere and isolated archipelagoes, the larger islands of New Guinea and New Zealand, and Australia, all representing a climatic situation tangibly unfamiliar to the United States Army in 1941.[10] Operations in this command area while primarily oriented to land campaigns, because of geographical realities, required naval inclusion. From transporting soldiers, their equipment, and supplies, naval seaborne transport was essential to the US Army in this region to initiate and maintain operations. This was a region oceanic in character and as such, the US Army and Navy, at least here, developed a degree of inter-service cooperation that was historically rare. From the beaches forward, the Army's ability to move, maneuver and engage enemy occupying extensive fortifications, and within topography often consisting of dense vegetation, required unique capabilities found in the US Army's combat engineers.

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[8] COMINCH to CINCPAC, April 3, 1942, Papers of Chester W. Nimitz, Archives Branch, Naval History and Heritage Command, Washington, DC., https://www.ibiblio.org/anrs/docs/Volumes/Nimitz_Graybook%20Volume%201.pdf.

[9] Morton, *Strategy and Command: The First Two Years*, 249.

[10] Ibid

Military engineering has an extensive historical record as a combat enabling or support element. Caesar utilized military engineering in its various forms throughout his Western European campaigns.[11] Such feats as bridging the Rhine or reducing formidable fortifications exemplify his application of this capability. By the close of the seventeenth century, European armies began organizing engineer or pioneer units as holistic units and uniquely employed them in a variety of battlefield applications, such as obstacle clearing.[12] For the United States, engineers played a prominent tactical role in what proved to be the decisive military victory of the American Revolution, the Yorktown campaign when these "Sappers" led the successful final assault against British fortifications.[13] Army engineers made significant contributions throughout the American Civil War, such as enabling General William T. Sherman's march from Atlanta to the Atlantic coast.[14] With the onset of the Industrial Revolution and the increasing mechanization of warfare as experienced in the First World War, the skillsets needed to wage such a war existed primarily within the Army's engineer branch. Thus, by 1941, the wide array of unique and indispensable capabilities provided by US Army engineers proved critical to modern, industrialized combat operations.[15]

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[11] Julius Caesar, *The Conquest of Gaul*, trans. F.P. Long (New York: Barnes & Noble, 2005), 147.

[12] Bruce I. Gudmundsson, "Engineers/Pioneers/Sappers," in *The Reader's Companion to Military History*, ed. Robert Cowley and Geoffrey Parker (New York: Houghton Mifflin Company, 1996), 153.

[13] Theodore P. Savas and J. David Dameron, *A Guide to the Battles of the American Revolution* (New York: Sevas Beatie, 2006), 334-5.

[14] Noah Andre Trudeau, *Southern Storm: Sherman's March to the Sea* (New York: Harper Collins Publishers, 2008), 55-56.

[15] Blanche D. Coll, Jean E. Keith, and Herbert H. Rosenthal, *United States Army in World War II: The Technical Services: The Corps of Engineers: Troops and Equipment*, (Washington, DC: Office of the Chief of Military History, Department of the Army, 1958), 12.

Combat engineering in 1941 represented only one aspect of the Army's engineer branch. Army engineers were responsible for erecting structures, constructing, and maintaining airfields, roads, surveying, cartography (map-making), and operating the Army's lumber mills. To name only a few of their functionalities. The prevalent conception of military engineers in historiography is of these functions with the combat skills and activities of mine clearing, obstacle (emplacement or reduction), fortification destruction, bridging, and fighting as infantry overlooked. Multiple reasons are attributable to this, such as the Army's definitive combat organization, the division being infantry in designation, the preeminent and most well-known combat branch, owing to its specialized nature and operational applicability, the largest Army engineer unit during World War II era was the Engineer Group, a headquarters entity, and an engineer holistic combat organization. Historical analysis of operations has then tended to emphasize the characteristics associated with combat, and often with the supposition of those formations or soldiers being exclusively those combat arms. The operational reality, however, in both design and execution during the Pacific War, and World War II in general, was more complex and structurally diverse. Close combat with the tenacious Japanese soldier combined with the circumstances of time and place often necessitated a skillset beyond that of the infantryman, artillerist, or tanker, and that skillset was the responsibility of the combat engineer. A topical reality that like the Army remains overlooked within the historiography of the Pacific War.

Figure 1: Engineer soldiers emplacing ponton bridge sections in position during a river-crossing maneuver in the Philippines, 1941. from: *U.S. Army in War World War II: Pictorial Record, The War Against Japan*, 2nd ed. (Washington, D.C.: The U.S. Army Center of Military History, United States Army, 2001), 28.

Allan R. Millett and Peter Maslowski offer quantitative evidence that the Pacific War of 1941 to 1945 was much more than a maritime conflagration and dominion of the US Navy or military sideshow for the US Army. For example, by December 1943 the Army had deployed to the Pacific 13 divisions compared to 17 assigned to the higher priority and better-publicized European theatre.[16] On its face, such empirical evidence suggests that this fact alone warrants greater historical examination of the US Army's role in the Pacific, but since 1945 this has not been so. The wide-scale absence of research, therefore, permeates all aspects of the service's Pacific operational record and this is true of the combat engineers. A search of doctoral dissertation and master's thesis repositories produced research projects associated with the Pacific War. However, only one dissertation examined the broader role and contributions of the US Army within the SWPA and not the exploits of specific branches such as the engineers.[17] Posterity should both address the absence of historical scrutiny as to SWPA Army contributions within scholarly research, and the ancillary military history exploring the experiences and operations of its specific branches. That then, at least from the perspective of the combat engineers, is the historical chasm this project aims to cross.

Mark Rohers notes in his essay, "Southwest Pacific" (2013) that this area of operations has been and remains overlooked in historiography. Distilling the historiography of the Army's experiences within the SWPA evidence suggests that research has centered upon two specific aspects: General Douglas MacArthur and experiences of the combat arms, primarily the US

[16] Allan R. Millett & Peter Maslowski, *For the Common Defense: A Military History of the United States of America*, rev. ed. (New York: The Free Press, 1994), 453.

[17] Robert Young, "They Too Fought the Japanese: The American Army's War in the Southwest Pacific" (PhD diss., The City University of New York, 2003), ProQuest Dissertations & Theses Global.

Army's infantry with a residual examination of field artillery and armored forces (tanks). That reality aside, multiple primary and secondary works proved beneficial to this project.

First-person accounts and memoirs surfaced in the years immediately following the war. An example is Brigadier General (Brig. Gen.) William F. Heavey's homage to the men of the amphibious engineers, *Down Ramp! The Story of the Army Amphibious Engineers* (1947).[18] Brig. Gen. Heavey commanded the 2nd Engineer Special Brigade throughout the war and within the SWPA theater. The Army's amphibious engineers (or Engineer Special Brigades) organized as another specialty within the engineer branch, but their germination was with the combat engineers, and their operational and tactical employment remained strongly associated with that of the combat engineers and as such warranted inclusion into this study.[19] Brig. Gen. Heavey's first-person monograph details the strategic and operational need for such a capability for the US Army at the operational and tactical levels. While applicable to all theaters of World War II, such a means was critically important to operations in the SWPA. He chronicles amphibious engineer training, equipment adaptation, and innovation and details the operational record of this military innovation. From a historiographical perspective, Brig. Gen. Heavey's most significant contribution concerns operational and tactical doctrine. Specifically, he explains the adaptation and evolutionary process during World War II from an engineer (amphibious) perspective, and how operational and tactical progression affected the prosecution of the war in the Southwest Pacific.

[18] Brigadier General William F. Heavey, *Down Ramp! The Story of the Army Amphibian Engineers*, (Washington, D.C.: 1947).

[19] Ibid, 1.

World War II-era US Army engineer doctrine, such as field and technical manuals are widely accessible and offer the scientific or technical foundation to pursue operational and tactical assessments of the combat engineers' Pacific War exploits. For engineer soldiers regardless of their eventual specialty, the foundational doctrinal publication was *FM 21-105, Basic Field Manual: Engineer Soldier's Handbook* (1943). [20] The opening chapter offers a brief explanation of engineer soldier expectations and an overview of the historical legacy of the US Army engineers.[21] Its most valuable contribution to the researcher is in outlining the various capabilities associated with the Engineer branch, their instruments or tools, and the engineer unit structure of the period in question.[22] Supplanting this baseline information source are more specialized US Army engineer manuals from the World War II era. Volumes such as *FM 5-25: Engineer Field Manual Explosives and Demolitions* (1942) and *FM 17-45: Armored Force Field Manual: Armored Engineer Battalion* convey (1942) the requisite parameters and skills associated with tasks outlined in each. The former naturally contains considerations and requirements associated with preparing and utilizing explosives as part of demolition missions and mine warfare.[23] Meanwhile, the *Armored Engineer Battalion* spells out the expectations of combat engineers in support of the US Army's armored formations (tanks) and skills exemplified by exercising that support.[24] Utilizing such sources for this project helps conceptualize the

[20] United States Army, *FM 21-105: Basic Field Manual: Engineer Soldier's Handbook*, (Washington, DC: United States War Department, 1943). Field and technical manual updates occur as needed or required. For example, doctrinal practice changes or equipment render current tactics, techniques, or procedures invalid. This process tends to occur more frequent in periods of conflict such as during World War II.

[21] Ibid, 1-2.

[22] Ibid, III.

[23] United States Army, *FM 5-25: Engineer Field Manual: Explosives and Demolitions*, (Washington, DC: United States War Department, 1942), III-IV.

[24] United States Army, *FM 17-45: Armored Force Field Manual: Armored Engineer Battalion*, (Washington, DC: United States War Department, 1942), III.

justifications for a specific tactical decision or the doctrinal reasons explaining why similar operations had differing operational plans.

Other official primary sources such as operational reports are crucial to assessing this topic. It is the historian's great fortune that Gen. MacArthur published his wartime headquarters reports. While questions of accuracy persist with specific components of these documents, their value from a command perspective is undeniable. MacArthur as Commander, SWPA was responsible for the failure or success associated with the strategic aspirations of this area of operations. Found within these official reports is the given end state and starting point for those planners responsible for contriving operational plans.[25]

Other beneficial primary sources are from the participants of the war in this theater. Contributors from throughout the military hierarchy provided personal accounts of their experience. US Eighth Army commander Gen. Robert Eichelberger's autobiography, *Our Jungle Road to Tokyo* (2015) provides an overview from a senior combatant commander's perspective. The perspective was the mechanism, which dictated the operational level considerations in the SWPA by theater-level strategic goals and conversely how those goals were achievable.[26]

At the opposite end of the military echelon is the personal memoir of Francis B. Catanzaro, *With the 41st Division in the Southwest Pacific* (2002). Although an infantryman and not a combat engineer, Catanzaro provides an account illustrating how accurately operational planning equated with tactical situations. Accounts of soldiers such as Catanzaro's offer a sampling, from the enlisted man's level, of confidence in leadership, up and down the Army's

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[25] Staff of General Douglas MacArthur, *Reports of General MacArthur: The Campaigns of MacArthur in the Pacific,* vol. 1 (Washington, DC: Office of the Chief of Military History, Department of the Army, 1950), 31.

[26] Eichelberger, GEN Robert L., *Our Jungle Road to Tokyo* [Illustrated Edition], (San Francisco: Verdun Press, 2015).

chain of command.[27] The database *America in World War Two: Oral Histories and Personal Accounts* contains primary sources associated with the war. Examples of materials reposited here are personal correspondence, newspapers, and unit histories. Of particular interest are these personal communications from the soldiers as they often present the most honest evaluation of not only the physical situation in which they found themselves, but of their leadership and the enemy as well. Operational details are absent owing to wartime censorship, but the tone of these letters or journals when paired with official operations reports often enhances context and opens the way to more pragmatic historical analysis.

The most prominent and significant treatments of the Army's operational record within the SWPA are the service's official history, the *United States Army in World War II*. The series, published over several years, covered the entirety of the Army's World War II operations. The eleven-volume sub-set *The War in the Pacific* included seven monographs detailing the Southwest Pacific. This chronologically organized collection covered all facets of the Army's SWPA experience. The authors relied primarily on official records, reports, and other documents to weave together a narrative overview of correlating operations in this theater. Five historians penned the SWPA treatments beginning with Louis Morton's first of two contributions, *The Fall of the Philippines* (1953). Morton recounts the opening months of the war, from Japan's initial attacks in December of 1941 through the cessation of American and Filipino organized resistance.[28] A note regarding Morton, he was and remains one of the more prominent American historians of the US Army's Pacific War experience. He served as an Army historian during the

[27] Francis B. Catanzaro, *With the 41st Division in the Southwest Pacific: A Foot Soldier's Story* (Bloomington, IN: Indiana University Press, 2002), 82.

[28] Louis Morton, *U.S. Army in World War II: The War in the Pacific: The Fall of the Philippines* (Washington, DC: *Office of the Chief of Military History, Department of the Army,* 1953).

war and following Japan's surrender, accepted a position with the Office of the Chief of Military History. In this position, he served as general editor, overseeing the completion of the Army's *Pacific War* series. He later composed *Strategy and Command: The First Two* Years (1962). As the title implies, this volume examined the story behind the establishment of the SWPA theater, the structure of the headquarters, and the development of strategic goals.[29]

Samuel Milner produced the next volume, *Victory in* Papua (1957). Milner too served in World War II as a historian with the Air Transport Command, Army Air Forces with duty in Australia and New Guinea. Milner provides an account of the Army's initial offensive campaign in the summer of 1942.[30] Within this volume, Milner chronicles the struggles experienced by the Army as it sought to gain its operational bearing with inexperienced soldiers and in difficult climatic conditions. Upon completing his one contribution to the series, Milner accepted a historian's position with the US Air Force's Air Weather Services.

John Miller Jr. penned the next volume, *Cartwheel: The Reduction of Rabaul* (1959). A Marine in World War II, Miller experienced combat during the Bougainville campaign. Upon his return home, he accepted a historian staff position within the Department of the Army. He authored multiple articles and books associated with World War II and later produced the service's official histories of the Korean War. *Cartwheel* recounts the critical campaign to destroy Japan's primary logistical and command base in the South Pacific at Rabaul.[31]

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[29] Morton, *Strategy and Command: The First Two Years*,

[30] Samuel Milner, *U.S. Army in World War II: The War in the Pacific: Victory in Papua* (Washington, DC: Officer of the Chief of Military History, Department of the Army, 1957).

[31] John Miller jr., *U.S. Army in World War II: The War in the Pacific: Cartwheel: The Reduction of Rabaul* (Washington, DC: Office of the Chief of Military History, Department of the Army, 1959).

Another prominent Pacific War historian of the mid and late-twentieth century authored two of the series' final three volumes. Robert Ross Smith first penned *The Approach to the Philippines* (1953) and later, the series' final volume, *Triumph in the Philippines* (1963). These works provide an overview of the campaigns that immediately preceded MacArthur's return to the archipelago, and as the latter's title suggests, the eventual American victory. Smith too served in the Pacific War as a historian on MacArthur's headquarters staff.[32] A proficient author of works concerning the war, he held for several years a position within the Office of the Chief of Military History.

M. Hamilton Cannon wrote the middle volume of the series, 1954's *The Return to the Philippines* (1954), in which he covers the period bracketed by the Smith works. This volume contains the essence of the operational record of MacArthur's Philippine campaign of 1944-1945.[33] In summation, this series represents the application of military history methodology in its most straightforward and fundamental sense with each volume overwhelmingly focused upon the strategic level. Incorporated into each is consideration of lower tactical and operational vignettes that provide battlefield context without analysis of branch-specific exploits such as that of the engineers.

To provide a more explicit record of the technical branches, the Army published the *U.S. Army in World War II: Technical Services* series. Four volumes comprise the engineer sub-set and provide an overview of the branch's functions and operations throughout the European and Pacific theaters. While providing valuable background information regarding engineer unit

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[32] Robert Ross Smith, *U.S. Army in World War II: The War in the Pacific: The Approach to the Philippines* (Washington, DC: Office of the Chief of Military History, Department of the Army, 1953) and *U.S. Army in World War II: The War in the Pacific: Triumph in the Philippines* (Washington, DC: Office of the Chief of Military History, Department of the Army, 1963).

[33] M. Hamilton Cannon, *U.S. Army in World War II: The War in the Pacific: The Return to the Philippines* (Washington, DC: Office of the Chief of Military History, Department of the Army, 1954).

structure, organization, equipment, and soldier training, absent is historical analysis correlating engineer doctrine, operations, and theater strategy. Two volumes are relevant information sources to this study.

First is *The Corps of Engineers: Troops and Equipment* (1958). This volume was a collaborative effort between Blanche D. Coll, Jean E. Keith, and Herbert H. Rosenthal. Coll served for years as a staff historian with the Historical Division, Officer of the Chief of Engineers while Keith occupied a position within the Engineer Historical Division and had served in World War II as a gunnery officer aboard a US Navy destroyer. Finally, Keith served with the 95th Infantry Division in Europe during the war. A professor at Southern Illinois University at the printing of this monograph, he had previously been associated with the Engineer Historical Division from 1948 to 1953. Penned in narrative format, pragmatically speaking it is a reference book. It covers a great deal of material, from the development of new equipment, wartime mapping, personnel training, organization, intelligence, aviation and ground units, and logistical considerations.[34]

Karl C. Dod's contribution to the series is the most pertinent to this research project. *The Technical Services: The Corps of Engineers: The War Against Japan* (1966) conceptually fits between the previous seven volumes of *The War in the Pacific* and the *Troops and Equipment* treatises. Dod structured his monograph as an operational chronology and correlating engineer contributions.[35] It is broad in scope, accounting for every role performed by engineers during SWPA operations. Another excellent resource, it is more a chronicle of engineer operations as opposed to an analysis of how specifically the branch's activities supported the greater strategic

[34] Coll, Keith, and Rosenthal, *The Corps of Engineers: Troops and Equipment*, xi-xvii.

[35] Karl C. Dod, *United States Army in World War II: The Technical Services: The Corps of Engineers: The War Against Japan*, (Washington, DC: Office of the Chief of Military History, Department of the Army, 1966).

goals. Dod served as an artillery officer during the war and afterward worked as a civilian historian within the Office of the Chief Engineer, Army Forces Pacific. In 1950, he migrated to the Engineer Historical Division where he continued to author works associated with the US Army engineers in World War II.

Circumstantial evidence suggests that American research of this theater for most of the four decades following the war often began and ended with Gen. MacArthur. The preponderance of academic research associated with the US Army's Pacific War history resulted in countless biographies and examinations of MacArthur's wartime role as theater commander-in-chief. An immense personality and polarizing figure in life, analysis of him and his exploits in historiography and biographies have been no less divergent. Reflecting the academic skepticism of the Post-Modern era, Boston College historian Carol Morris Petillo's *Douglas MacArthur: The Philippine Years* (1981) is a psychological examination of MacArthur and his generalship. Another MacArthur biographer was historian and professor of history at Mississippi State University, Dorris (D) James Clayton. Clayton also taught at the Virginia Military Institute, the US Army's Command and Staff School, and War College, and penned a three-volume biography of the general. *The Years of MacArthur* (1971, 1975, and 1985) retains within academia the perception as the best-researched treatment of the general. Yet discussion and analysis of operations within the wider Southwest Pacific area and how the combat engineers buttressed them are periphery trappings without scrutiny. A more recent assessment of MacArthur, explicitly during the war years of 1941-1945 is Walter R. Borneman's *MacArthur at War: World War II in the Pacific* (2016). Borneman, who has authored other monographs concerning the Pacific War offers a balanced examination of MacArthur as a theater commander. MacArthur's strengths and weaknesses influenced his perspective on command and those personal traits in

turn influenced his performance in that role. Borneman's conclusions are favorable of MacArthur as a theater commander while noting the inherent human complexities that universally affect the course of all conflict.[36]

From topical bibliographical reviews, a discernable shift in research emphasis emerged by the late 1980s and early 1990s. Discussion of Pacific War historiography starting at the arbitrary threshold of the late twentieth century most naturally might be with Ronald H. Spector's *Eagle Against the Sun* (1985). A popular narrative among the public, it is an oft-referenced source in bibliographies and recommended reading sections of scholarly monographs and articles. Spector is a veteran of the Vietnam War and a scholar peers consider a preeminent military historian with expertise in twentieth-century warfare and international matters. Spector has instructed courses at the US Naval and Army War Colleges and is now a history professor at George Washington University. A comprehensive narrative history of the Pacific War, *Eagle*, attempts to examine the war from both American and Japanese perspectives. While incorporating analysis of SWPA operations, due to the constraint of scope, his historical scrutiny is at the strategic level and correlating critical decisions or operations.

A prominent contemporary historian of the Southwest Pacific war is Bruce Gamble, former US Navy fighter pilot and staff historian at the Naval Aviation Museum Foundation. Within the past twenty-five years, Gamble has published six works associated with the Pacific War, including a three-volume series on Japan's primary operational and logistical base in the SWPA at Rabaul and the Allied effort to eliminate it. This trilogy consists of *Invasion Rabaul* (originally published as *Darkest Hour* in 2006), *Fortress Rabaul* (2010), and *Target Rabaul* (2013) providing the most comprehensive overview of this strategically important and

[36] Walter R. Borneman, *MacArthur At War: World War II in the Pacific* (New York: Little, Brown and Company, 2016), 508.

overlooked objective to date. However, its research focus is an exhaustive analysis of the aviation, naval, and land campaign components. This leaves little space for full exploration of branch-specific contributions like combat engineer operations.

Another recent monograph dissecting the Pacific War is *The Pacific War: From Pearl Harbor to Okinawa* (2015). An exhaustive inquiry into this war, the scope of *The Pacific War* considers this theater consisting of those operations conducted by the US Navy and Marine Corps.[37] The authors yet again demonstrate historiography's limited research focus by omitting campaigns on New Guinea, New Britain, and other US Army SWPA operations. For example, neither the book's Foreword nor Introduction addresses the US' initial conflagration with and eventual loathsome surrender to the IJA between December 1941 and May 1942. [38] This a glaring omission considering the implications to the US military from such a strategic defeat and the emotional strike the American people experienced due to this setback and subsequent brutal treatment of Americans and Filipinos at the hands of IJA during what became known as the Bataan Death March. That this occurred within six months of Japan's unwarranted initial attacks, therefore, seems a natural inclusion for any serious examination of the Pacific War as contextual significance, regardless of the central historical question. Contrast that with the detailed dissection of this calamity by Richard Frank in his comprehensive missive of this theater in *Tower of Skulls: A History of the Asia-Pacific War; July 1937 – May 1942* (2020).

Harry A. Gailey was an emeritus professor of history at San Jose State University and his book, *MacArthur's Victory: The War in New Guinea, 1943-1944* (2004) examines the strategic

[37] Gordon L. Rottman, Robert O'Neill, and Dale Dye, *The Pacific War: From Pearl Harbor to Okinawa* (London: Bloomsbury Publishing Plc, 2015).

[38] Ibid, vii-xii.

and operational aspects of the Americans and Australian campaigns to evict Japan from New Guinea. Gailey's narrative conveys the inherent complexities of military campaigning. Another attribute of this volume is Gailey's discussion of the added difficulties faced by MacArthur, especially in 1943, as US industrial production was not yet at its apex and the SWPA at the bottom of the priority list for logistics or supplies, had to make do with the resources at hand.[39]

During the SWPA's culminating Philippine campaign, the US and Japan waged a titanic battle within the capital city of Manila. James M. Scott covers this episode in *Rampage: MacArthur, Yamashita, and the Battle of Manila* (2018). The defining aspect of this work is that this conflagration represented a type of fighting diametrically different from that, which characterized the balance of Pacific War combat. Close combat in an urban setting was more akin to the European theater than the Pacific theater. For the combat engineers, as with the rest of the US Army, tactical flexibility was critical, and Scott deftly addressed this dexterity.[40]

The Ghost Mountain Boys: Their Epic March and the Terrifying Battle for New Guinea Forgotten War of the South Pacific (2007) by James Campbell offers a thorough account of the tactical level of the war.[41] In the spirit of the Gailey monograph, Campbell's narrative highlights the material shortcomings faced by soldiers in this early campaign. Its contribution to this project rests with the conveyance of the skill of adaptability displayed by the American soldier in this theater of war. The most recent additions to Pacific War historiography and the most substantial for the US Army are John C. McManus's U.S. Army Pacific War trilogy comprised of *Fire and*

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[39] Harry A. Gailey, *MacArthur's Victory: The War in New Guinea, 1943-1944* (New York: Presidio Press, 2004).

[40] James M. Scott, *Rampage: MacArthur, Yamashita, and the Battle of Manila* (New York: W. W. Norton & Company, 2018).

[41] James Campbell, *The Ghost Mountain Boys: Their Epic March and the Terrifying Battle for New Guinea-The Forgotten War of the South Pacific* (New York: Crown Publishers, 2007), xv.

Fortitude: The U.S. Army in the Pacific War, 1941-1943 (2019), *Island Infernos: The U.S. Army's Pacific War Odyssey, 1944* (2021), and *To the End of the Earth: The U.S. Army and the Downfall of* Japan (2023) represent the most comprehensive examination of the US Army in the war against Japan. McManus analyzes the service's experience from the uppermost echelons of command to the most inconspicuous private. This work's scope is all-encompassing in that he analyzes all three theaters of the Pacific War beyond the Southwest Pacific. Thoroughly researched, this trilogy helps provide greater operational and tactical context in a broad treatment.

In researching this topic, two works explicitly associated with US Army engineers and the Southwest Pacific region emerged. Major Natalie M. Pearson's *Engineer Aviation Units in the Southwest Pacific Theater During WWII* (2015) and Barry W. Fowle's *Builders and Fighters: U.S. Army Engineers in World War II* (2021). Major Pearson composed her thesis while at the US Army's Command and Staff School. Her research focuses on the contributions made by the engineers in support of aviation operations, a critical component of MacArthur's Southwest Pacific command, but not combat engineer operations per se. Barry Fowle is a retired US Army Lieutenant Colonel (Lt. Col.) and former Instructor of Military History at the US Army Engineer School. *Builders and Fighters* is a single-volume overview of US Army engineers within each theater of World War II. While it includes combat engineer vignettes, it is not an in-depth analysis of combat engineering as noted in the monograph's introduction, it "is not comprehensive, but rather seeks to present a representative sampling of the engineers' activities in the war." One last source merits acknowledgment: Eugene L. Rasor's *The Southwest Pacific Campaign, 1941-1945: Historiography and Annotated Bibliography* (1996) is an indispensable resource for the historian and researcher of this theater of World War II. While absent works

published since its printing over twenty-five years ago, it remains relevant, if for no other reason, due to its lists of Southwest Pacific War primary source material and pertinent archives associated with the discipline of military history.

This project addresses or at least begins to address this unique gap of the US Army's combat engineers within the larger omission of the US Army's Pacific War contributions in general. For the student or researcher of the war between the US and Imperial Japan to appreciate the imposition of place (geography, topography, weather, distance) upon military operations requires to relative degrees, of course, an awareness of those soldiers responsible for minimizing those effects while additionally fighting as infantry when called upon. This dissertation offers foundational information, at least within the SWPA, and points to other sources of information that can help advance that comprehension.

Military history at times has the propensity for presenting its subjects with an aura of inevitability. That the United States defeated Japan in the Pacific War is a historical fact and this project does not seek to address causation as characterized by David Hackett Fisher about this war or treat the topic with such inevitability.[42] Moreover, this study demonstrates that the common perception in the historiography of the United States simply bludgeoning through attrition Japan with industrial and economic superiority is overly simplistic and, patently false. The US Army, alongside the Navy and Marine Corps, defeated Japan in combat and did so with an ever-increasing level of martial and naval proficiency. This summation rests upon the empirical evidence found in the evolution and adaptation of doctrine that combined with simultaneous progression in tactical acumen led to the eventual outcome of the war.

[42] David Hackett Fisher, *Historians' Fallacies: Toward a Logic of Historical Thought* (New York: Harper & Row Publishers, 1970), see Chapter IV in which Fisher outlines this specific fallacy of historical thought and practice.

Another feature of military history methodology not previously addressed but characterizing this project is that of qualitative research and analysis versus quantitative analysis. The historical claim and supporting reasons offered in this project by their nature dissuade quantitative methodology. Military doctrine is a collection of ideas and principles universally incorporated into the operational design and tactical implementation. It is not a system of definitive steps or concrete processes unilaterally applicable to all situations. Doctrine properly applied affords latitude to the individual battlefield commander through critical thinking and not programmed regurgitation. The US Army in its prosecution of the Pacific War exemplified this intellectual flexibility by having tailored its tactics, techniques, and procedures to fit the circumstances of the time, place, and enemy without abdicating the principles or fundamentals of war.

As noted previously in outlining the critical works associated with this research project, acquiring a conceptual framework of the US Army engineers is foundational to both topical comprehension and the application of historical methodology. To construct a compelling and empirical argument for the US Army's eventual military success and the engineers' contribution requires a foundational knowledge of the most basic, and necessary skills required of the combat engineer soldier. Without that edifice, the subsequent analysis of collective tactical, operational, and eventually strategic practices and outcomes have no premise. Therefore, the body of this project examines the doctrinal evolution of the US Army's combat engineers by applying their doctrine to the levels of war, the indispensable contribution of leadership, and the incorporation of modern technology, the tools of the trade in the application of evolving doctrine. It aims to accomplish this by answering the question of how MacArthur succeeded strategically through the tactical contributions of the combat engineers.

Identifying and distinguishing between the various levels of war is a critical component of this project. Thus, Chapter 2 first defines the strategic, operational, and tactical levels of war to establish those important distinctions. Following this comparative summary, an overview of the strategic situation in the Southwest Pacific Area in the spring of 1942 will set the stage for the eventual operational and tactical discussions of the combat engineer missions throughout this area of operations from that point in time until the war's end, or at least until combat operations ceased in August of 1945.

Building upon that framework, Chapter 3 disassembles combined arms operational design and doctrine to explore it in greater intimate detail. Winning the Pacific War required consistent operational cooperation internally among the various branches of the US Army and externally with the US Navy specifically. The argument that the US achieved its broad strategic goals warrants a discussion on the combined arms nature of operations in this theater. Military operations are human endeavors. As such, the unavoidable truth is that human beings with all their inherent foibles are the most necessary element of military operations. Chapter 4 examines the question of how human involvement through the application of leadership affected the evolution of combat engineers in the Southwest Pacific Area. There were no innovative ideas or equipment that affected operational outcomes without the human element, and that applies to decisions made that affected the outcome of engagements and saved lives.

Chapter 5 is a copious analysis of combat engineer doctrine and the evolutionary process it experienced because of and during the Pacific War. This project accomplishes this by examining the US Army's Southwest Pacific Area operational record through the application of this doctrine. Identification and discussion of how doctrine evolved with the progression of these combat operations represent the central theme of this section. Chapter 6 is an exhaustive

overview of the explicit combat capabilities and responsibilities of combat engineers. In this role, combat engineers did not support or supplant solely infantrymen, but armored soldiers as well. In summary, this portion explores how the employment of combat engineers at the tactical level relates to strategic vision.

While acknowledging the fighting role of the combat engineer as the central tenet of this project, it would be shortsighted not to examine and incorporate ancillary discussion of their correlating role as builders. Combat engineering in the application is much more than fighting as supplemental infantry. If that were the only expectation of these soldiers there ultimately would be no need for the unique skills of the combat engineer, but simply more infantrymen. This skill set, while perhaps not as dramatic as engaging in persistent combat, is nonetheless just as critical to tactical success by enabling combat operations and in situations more favorable to the commander on the battlefield.

Of all the evolutionary realities experienced by the US Army combat engineers in the Pacific War, none was as unique as that of amphibious operations. Chapter 7 is a detailed examination of this new engineer role. Exploration of this doctrinal development outlines how it became a critical element of US Army combat operations in this theater and strategic achievement in the broader consideration. A key consideration of this new role was the corresponding need for the appropriate amphibious equipment to adequately perform it. While a positive development for the combat engineers of the Southwest Pacific Area, the reality was that this theater was at the bottom of the logistical priority list. This situation was acute in the 1942-1943 period, but by mid-1944, the burgeoning industrial capacity of the US allowed for a more equitable dispersion of equipment and material. Once received, how did the combat engineers employ their tools to allow for success, primarily at the tactical level of war? That is another

inquiry tackled in this section. Chapter 8 summarizes the examination of the US Army's combat engineers in the Southwest Pacific Area. The US Army experienced significant transformation because of World War II and the engineers exemplified that reality in every detail.

The essence of this project is to present the case for military evolution or adaptation in all its facets, which combined with correlating factors, enabled General MacArthur to achieve his strategic goals through the tactical contributions of the combat engineers. It is a focused explication of a specific and in many ways unique, Army organization. Why does such a study matter (so what)? Appreciation and comprehension of US combat engineers advance the field of military history by detailing the complexity of the effort in World War II. Combat in war must have extensive and to varying degrees, deep roots in operational planning and strategic vision. It can be intellectually difficult, especially eight decades later, to comprehend the enormity of the United States' effort in fighting and eventually winning World War II. Alongside that, while prosecuting war throughout the world, the US Army (and Army Air Corps), US Navy, and Marine Corps had to procure and train personnel while adapting doctrine, tactics, techniques, and procedures to better fit the circumstances of time, place, and enemy.

America's Pacific War with Japan was and remains in many aspects a unique and macabre event. In the Southwest Pacific Area from 1941 to 1945, reality rendered operations here exceptionally complex. The account of how the US Army responded to this reality not only speaks well of those who were within the service at that time but by extension the nation. This project, through its study of a specific and small component of the US Army in World War II, represents a qualitative sampling of the necessary and comprehensive national effort to defeat the forces of Japan and its nominal partners. While situational specifics and goals change with circumstances, the process (on varying scales of course) is applicable across American military

history. The onset of war in 1941 found the nation and the US Army specifically, unprepared for war. Doctrinal adaptation and evolution throughout the Army were necessary to engage the two most pernicious military threats in American history. The US Army engineer branch's motto is "*Essayons*," Latin for "let us try" and it is quite appropriate considering their World War II experience, especially in the Southwest Pacific Area. The early months and years of this war in retrospect represented an organizational odyssey, a tribulation that made necessary and possible the evolution of US Army combat engineer operational and tactical doctrine that in turn, allowed for the attainment of both General MacArthur's strategic goals at the theater commander level and simultaneously the US national policy of defeating Japan in the Pacific War of 1941 to 1945.

Chapter II:

The Levels of War and Pacific Strategic Setting Overview

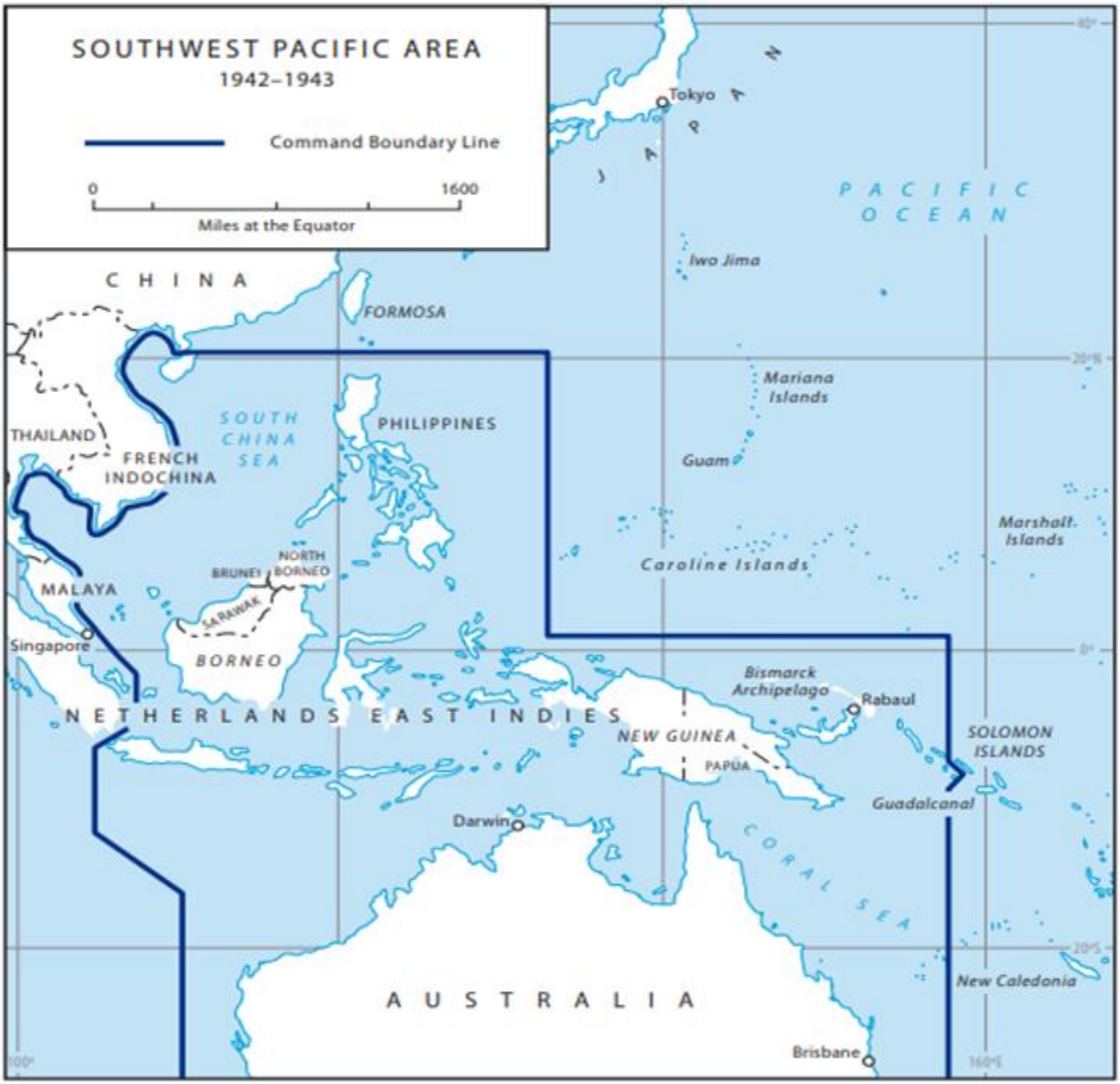

Figure 2: Map of the Southwest Pacific Area (SWPA). GEN MacArthur's command area of responsibility. Map from: Edward J. Drea. *New Guinea: The U.S (United States). Army Campaigns of World War II* (Washington, D.C.: The U.S. Army Center of Military History, United States Army, 2019), 9.

In practice, war has multiple levels, each containing its respective elements and expectations. During World War II, the leading military powers each held their respective theorems of war. The US Army, in holding with intellectual tradition, in 1940, but not exclusively, subscribed to the ideas of Swiss-born thinker, Antoine-Henri Jomini. Jomini's principal notion simply is that strategic victory resulted from defeating the enemy at the decisive point by massing one's forces and attacking.[43] The frequent references to French Marshall Ferdinand Foch (of World War I fame and whose "Economy of Force" concept explicitly correlates to Jomini's notion) by many of the era's officers demonstrates the collective resonance within the US Army.[44] In his view, war was not necessarily an extension of political strategy in a broad sense, but nearly an experience unto itself. Therefore, the delineation of strategy and tactics was less well-defined. Jomini's narrow and simplistic summation of war may have offered some utility in the eighteenth and nineteenth centuries but is ill-suited for this analytical undertaking.

Another prominent early nineteenth-century military thinker, Jomini's contemporary, offers a broader framework to analyze the Army in the SWPA and specifically the combat engineer role. Prussian officer Carl Von Clausewitz, a veteran of the Napoleonic Wars offers more complex and distinct definitions of the strategic and tactical levels of war. Clausewitz's ideas are better suited to assessing the more complex nature of World War II despite emanating from the same period as Jomini. In simple terms, Clausewitz characterized strategy as the

[43] John Shy, "Jomini," in *Makers of Modern Strategy: From Machiavelli to the Nuclear Age*, ed. Peter Paret (Princeton, NJ: Princeton University Press, 1986), 146.

[44] Major General Frank Parker, "The Ever-changing Application of the Unchanging Principles of War," *Military Review* XIX, no. 75 (December 1939), 6.

overarching goal of war, the objectives associated with operations and campaigns.[45] He categorized the tactical level as the execution of the given purposes. Thus, the strategic level is higher, while the tactical level is lower (the higher establishing the framework for the lower). As Clausewitz qualified them, commanders and soldiers utilized tactics in moving to and conducting battle.[46] These elements are not mutually exclusive. To attain strategic aims requires tactical success relative to political realities and strategic scope. In the Southwest Pacific Area or SWPA, United States Army tactics, rooted in doctrine, had to adapt to the situational realities.

Applying these categorizations to the contextual realities facing the United States in the immediacy of Japan's December 1941 attacks leads to the following supposition. The US Pacific War's strategic goal was to defeat Japan. This required US military and naval forces to engage Japanese forces and decisively defeat them. The tremendous strategic question confronting US leaders (civil, military, and naval) was how to attain this goal within the broader global war strategy. As Louis Morton points out, the Pacific War strategy was not unilateral in development but correlated with the simultaneous war against Nazi Germany and a broader worldwide war strategy.[47] The consensus among these decision-makers was that the initial US strategy in the fight against Japan was to hold, as best it could, from assuming the strategic defensive. However, throughout the war, as US industrial capability and extensive manpower reserves swelled the

[45] Carl Von Clausewitz, *On War*, ed. and trans. Michael Howard and Peter Paret (Princeton: Princeton University Press, 1976), 128.

[46] Ibid.

[47] Louis Morton, *U.S. Army in World War II: The War in the Pacific: Strategy and Command: The First Two Years* (1962; repr., Washington, D.C.: Center of Military History: United States Army, 2000), 158-9.

Army and Navy ranks, overwhelming offensive tempo and destructive power must obliterate Japan's collective will to continue to fight.[48]

Japan's apparent strategically solid position in early 1942 was in part due to the US's European-centric focus politically and militarily during the intervening years between World War I and II. From an American perspective, only the US Navy held a Pacific-Asia focus.[49] This is not to assert that the US Army did not prepare strategic plans associated with a possible future war with Japan; they did produce such a plan in conjunction with the Navy known as War Plan ORANGE.[50] This plan underwent multiple revisions from its initial development in 1913 and the onset of war in 1941.[51] For the Army, the Pacific strategy centered upon the preservation of the Philippines, the presumed primary strategic objective of Japan.[52] However, the strategic reality was that whether solely in the Philippine Archipelago or across the various Pacific island chains, the Army in general and the combat engineer branch, in particular, would have to, out of necessity, prepare novel tactics.

Japan following World War I, took advantage of a resurgent isolationist American attitude and then the economic malaise of the 1930s, which curtailed military and naval budgets between the end of World War I and the first Franklin D. Roosevelt administration. Combined with their various League of Nations mandates, Japan set itself upon an imperialist trajectory and potential

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[48] Victor Davis Hanson, *The Second World Wars: How the First Global Conflict was Fought and Won* (New York: Basic Books, 2017), 518-19.

[49] Louis Morton, *United States Army in World War II: The War in the Pacific: Strategy and Command: The First Two Years*, (1962; repr., Washington, D.C.: Center of Military History, United States Army, 2000), 67.

[50] Ibid, 24-44.

[51] Ronald H. Spector, *The Eagle Against the Sun: The American War With Japan*, (New York: Vintage Books, 1985), 57.

[52] Morton, *Strategy and Command: The First Two Years*, (1962; repr., Washington, D.C.: Center of Military History, United States Army, 2000), 27-31.

conflagration with the US. Thus, the onset of war in 1941 found Japan better situated strategically than the US. The US had to bring the fight to Japan to achieve its strategic goals. While the national priority remained the defeat of Nazi Germany, US political, military, and naval leaders understood that offensive operations in the Pacific, albeit initially limited in scope and scale, were necessary.

Beyond the answers of what Gen. Douglas MacArthur sought to achieve in the Southwest Pacific Area or SWPA were the correlating considerations of how the strategic goals were to become more than words on paper or haughty speeches by national leaders. This is Clausewitz's tactical element of military operations. First, the penultimate component of military formations, both from an organizational standpoint and the ability to conduct operations is manpower. Something that, despite Washington's promises to the contrary throughout 1941, was altogether unfeasible (this representing the best-case scenario with the worst-case scenario being that Washington at no time had the intention or ability to provide such supplemental US reinforcements) in the aftermath of Japan's initiation of hostilities in December of that year.[53] On this point, Richard Frank, similar to many other historians, finds the promises of the Roosevelt administration and his military and naval chiefs somewhat dubious.[54] However, the reality is a bit more convoluted. Belying the military and maritime juggernaut that it would become later in the war, as the calendar transitioned to 1942, the US did not have the capability (men, munitions, and supplies) to carry the fight to Japan nor the wherewithal (shipping capacity) to do so even

[53] Richard B. Frank, *Tower of Skulls: A History of the Asia-Pacific War, July 1937-May 1942* (New York: W.W. Norton & Company, 2020), 444.

[54] For additional discussions on this matter see Ronald H. Spector, *Eagle Against the Sun: The American War with Japan* (New York: Vintage Books, 1985), Chapter Three and Mark A. Stoler, *Allies and Adversaries: The Joint Chiefs of Staff, The Grand Alliance, and U.S. Strategy in World War II* (Chapel Hill, NC: The University of North Carolina Press, 2012), Chapter 4.

had the former sufficiently existed.[55] For the US Army's combat engineers, this represented one of many structural and operational considerations under contemplation at the war's onset.

The combat engineers' operational or tactical quandary associated with SWPA theater strategic goals began with the operational puzzle of enabling maneuver to, amongst, and upon an island and maritime topography. Suppose examining this aspect through the military theorists' suppositions, precisely that of B.H. Liddell Hart, one of the engineers' initial ruminations, was to ascertain how best to enable the US Army's ability to eliminate Japanese military resistance "through the exploitation of movement and surprise."[56] The problem for the Army's combat engineers and its planners (at both the tactical and strategic levels) was planning and executing the initial mobility element of offensive campaigns against prepared Japanese fighting positions. However, this illustrates only one aspect of the tactical problems facing the US Army and Gen. MacArthur in the early months of 1942.

Williamson A. Murray notes that MacArthur devised and implemented a tactical approach that left the various Japanese garrisons across the region flat-footed, which was the practice of island hopping.[57] This operational or tactical design consisted of US Army formations identifying and attacking select island objectives, not every Japanese-occupied island or garrison. This resulted in MacArthur's forces seizing and maintaining the strategic initiative while isolating Japanese forces on those islands bypassed. Thus, the US could and did achieve its strategic objectives without having to fight and defeat in battle every Japanese-occupied island

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[55] Winston S. Churchill, *The Second World War: Volume III: The Grand Alliance* (Boston: Houghton Mifflin Company, 1950), 622-23.

[56] B.H. Liddell Hart, *Strategy* (New York: Tannenberg Publishing, 2014), 301.

[57] Williamson A. Murray, "The World at War," in *The Cambridge History of Warfare*, ed. Geoffrey Parker (New York: Cambridge University Press, 2005), 357.

within the SWPA theater of operations. This represented a seismic revolution in US tactical doctrine for the Army and the engineer branch.[58]

The US' doctrinal flexibility in this sense reveals its martial and ideological ingenuity and its industrial capacity. As noted by various military historians such as McGregor Knox and Williamson Murray while discussing revolutions in warfare, a correlating and often overlooked inherent element of tactical evolution exists within the three dimensions of ground, water, and now aerial.[59] A full implementation of the US Army combined arms in this war because of industrial progression. While such a reality is applicable across the entirety of the US World War II operational and strategic experience, such a technical revolution is most notably associated with the innovation of assault landing craft. In the interwar period, and rightfully beginning with the US Marine Corps, amphibious operations became an operational consideration. For the US Army, such a tactical operation did not become a significant element until after Japan's attacks of December 1941. [60] As it became clear that the war against Japan required necessary army operational contributions beyond what the Marines alone could provide, the critical element of amphibious warfare became self-evident. Within the Army's existing functional branches, the obvious choice was that of the engineers.[61] Subsequent chapters of this dissertation address this doctrinal and tactical evolution.

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[58] Blanche D. Coll, Jean E. Keith, and Herbert H. Rosenthal, *The United States Army in World War II: The Technical Services: The Corps of Engineers: Troops and Equipment*, (1958; repr. Washington, D.C.: Center of Military History, The United States Army, 2002), 358.

[59] McGregor Knox and Williamson Murray, "Thinking About Revolutions in Warfare," in *The Dynamics of Military Revolution: 1300 – 2050*, ed. MacGregor Knox and Williamson Murray (New York: Cambridge University Press, 2001), 10.

[60] Coll, Keith and Rosenthal, *The Corps of Engineers: Troops and Equipment*, (1958; repr. Washington, D.C.: Center of Military History, The United States Army, 2002), 358.

[61] Ibid.

The ultimate component of war's strategic and tactical elements is the realization that these two elements are inherently linked. More emphatically, they are not mutually exclusive. MacArthur and his US Army formations of the SWPA command could only plan and execute effective tactical operations with clear strategic aims as their guide. Army operational doctrine has traditionally noted that a commander's visualization of what a successful end state entails is an essential operational facet.[62] Strategic aims are both broad and inflexible. What strategy represents is the foundation of what an army, and in this instance, MacArthur, within his assigned SWPA theater, had to achieve for US national policy to be successful. Conversely, higher-level commanders do not specify or dictate the character of tactics.

At the tactical level, conditions at a given point and time on the battlefield influence the nature of combat methodology. Therefore, local commanders must have the latitude to assess each series of circumstances and determine the most appropriate or effective employment of battlefield tactics. This was especially true of US Army commanders in the SWPA theater. Combat operations on the islands of the Pacific differed from those in the Mediterranean and European theaters. Isolated operational areas without consistent communications to higher headquarters rendered it critical that commanders determine with a degree of immediacy how to seize their specific, local objective(s). In this primitive environment, the employment of combat engineers and their unique capabilities were a significant multiplier of US Army combat effectiveness. This, too, is a topic of detailed analysis in later chapters. Whether it required these multi-skilled soldiers to clear obstacles, emplace demolitions to reduce Japanese fortifications, hastily emplace bridging to span a crossing, or fight as and alongside infantry, combat engineers contributed to the tactical and strategic achievements of the US Army in the SWPA. Such a

[62] United States Army, *FM 100-5: Field Service Regulations: Operations*, (Washington, DC: United States War Department, 1941), 26.

multi-faceted military reality was impressive and necessary to transport, fight, and sustain operations across an immense battlespace.

As implied previously, war is an inherently complex enterprise, increasing with time, distance, weather, and spatial considerations. Within six months of the onset of the war, the US military and naval formations faced a formidable chain of island outposts with the Imperial Japanese Navy in control of Pacific waters. Therefore, in 1942 incredibly steep was the climb to the summit of success for the US; the first step in this conflagration required American leaders (civilian and military) at the national level to qualify the nation's war aims and provide the soldiers, and sailors, marines, and airmen coherent plans to achieve that desired outcome. President Roosevelt and his military advisors, the chiefs of the US Army, US Army Air Forces, and Navy, outlined US national policy for the defeat of Japan comprising the following strategic aims:

1. Retain possession of island garrisons between the US and the Southwest Pacific region (Australia and New Zealand) to secure communication between the two and to support future operations against the Japanese.
2. Contain further Japanese offensive operations.
3. Provide for the coastal defense of the North American Continent.
4. Finally, preserve the critical air and sea lanes across the Pacific, not simply between the mainland and Hawaii but again between the US and Southwest Pacific region. [63]

[63] Admiral Ernest J. King (COMINCH) message to Admiral Chester Nimitz (CINCPAC), "Message outlining strategic objectives for the Pacific War against Japan," Box 103, MR300.3, Sec. 1 Warfare-Plans and Operations-Geographic Divisions, Theaters, Commands, (Directives governing), April 1942 – October 1944, Franklin D. Roosevelt, Papers as President: Map Room Papers, 1941 – 1945, Franklin Delano Roosevelt Presidential Library and Museum, 2011, http://www.fdrlibrary.marist.edu/_resources/images/mr/mr0597.pdf.

The vastness of the Pacific Ocean, the remoteness of its scattered islands or archipelagos, and the absence of contemporaneous logistical infrastructure presented the US with a war environment unknown to its martial and naval services. From that reality emerged a unique set of problems, namely the means, and methods to achieve those strategic aspirations and the absolute defeat of Japan.[64] The challenge to the United States at the end of 1941 consisted of pursuing two large-scale wars worldwide, one requiring the adaptation of existing doctrine and, in various components, new doctrine altogether amid fighting.

The preponderance of such adaptation was with the US Army and, to a lesser degree, the US Marine Corps. The character of the Pacific War was such that the US Navy would have service supremacy in scale. Still, there would be a need for substantial land forces, especially in the operational area designated as the SWPA.[65] Supporting naval operations across the expanses of the Pacific Ocean required securing logistical and operational locations or bases, necessitating the seizure of Japanese garrisons. For the Army in its principal operational area, again the SWPA, the tactics, techniques, and procedures for conducting combat operations upon small islands, often isolated by hundreds if not thousands of miles from primary supply locations, presented new challenges. Hurdles that required the army to work alongside naval and air standard components still needed to occur, and more importantly to the army internally, operational collaboration across its various branches. This resulted in seismic doctrinal evolution for the US Army's combat engineers.

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[64] Franklin D. Roosevelt, "Address to Congress – Declaring War on Japan (speech file 1400) [known as the Day of Infamy address], December 8, 1941," Box 63, Franklin D. Roosevelt, Master Speech File, 1898 – 1945, Franklin D. Roosevelt Presidential Library and Museum, 2011. http://www.fdrlibrary.marist.edu/_resources/images/msf/msfb0002.

[65] Stephen R. Taaffe, *Marshall, and His Generals: U.S. Army Commanders in World War II*, (Lawrence, KS: University of Kansas Press, 2011), 18.

This evolutionary process appeared simple enough in theory and evident for the US Navy based on the realities of the operational environment. However, as Kevin C. Holzimmer notes, for the US Army to project its combat power onto the various islands across the Southwest Pacific theater was an operational puzzle necessitating doctrinal and operational adaptation on a grand scale.[66] The US Army had to answer how to move its formations to the necessary operational objectives to support strategic aims. Amphibious operations thus became a critical element of army operations in the SWPA broadly and the engineers specifically.

This existing scant analysis of the US Army in the SWPA is even scanter in examining the amphibious phases of these operations. In the historiography of the SWPA, it is a remarkable omission considering the environmental realities of the theater. It was a given that the US would have to transport its personnel, munitions, equipment, and supplies across the globe. Still, the overlooked aspect of this war, at least in this specific area, also required amphibious maneuvering. Added to that was the difficulty of landing ashore against entrenched Japanese forces.

MacArthur had his strategic objectives, but the always-present reality of the national policy of Germany first influenced not only the scale of offensive operations but also the scale of forces available to his command. Conventional examination of MacArthur's operations has noted his use of island hopping as an operational tenant. While obvious in hindsight, MacArthur in the SWPA implemented a practice born from necessity. Targeting specific islands and Japanese garrisons and ignoring and isolating them became critical to SWPA's operational plans.

Intended or not, the US bifurcation of the Pacific theater resulted in a multi-pronged advance toward Japan, forcing Japan to disperse its finite manpower and resources. Such a war

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[66] Kevin C. Holzimmer, "In Close Country: World War II American Armor Tactics in the Jungles of the Southwest Pacific," *Armor* 106, no. 4 (Jul/Aug 1997), 22.

fought over a protracted timeline bled Japan white and afforded the US time and space to build a military and naval behemoth. As its martial power increased, the US seized the tactical and strategic initiative, applying constant pressure on Japan and eventual American victory.

The most pressing strategic issue confronting the US in 1941 and early 1942 was the direction or route to attack and who would command.[67] US military and naval command doctrine has traditionally emphasized unit of command in operational execution. This means a single combat commander in a geographic theater or area of operations. The Pacific presented a unique challenge for that principle due to its physical and situational realities.

Would such a vast geographical area be suitable for a single combat commander? Secondly, if the answer to the single or unified commander questions was yes, then was it to be the US Army or Navy assigned that responsibility? Furthermore, what was President Roosevelt to do with MacArthur if not recalled and retired? No Navy flag officer was senior in rank. Naturally, the US Navy must occupy a preeminent role in the war with Japan across the Pacific Ocean; however, within the SWPA, a greater propensity of islands (both in number and size) necessitated US Army participation. The historiography of the war continues to overlook this fact. The reality is that the Army contributed both in terms of personnel and operationally to a level warranting more research than historiography has thus far afforded. By August 1945, the US Army deployed three field armies and twenty-one divisions to the Pacific War.[68] This represented 37% of the United States' total effort in the Pacific War.[69]

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[67] Phillip S. Meilinger, "Unity of Command in the Pacific During World War II," *Joint Force Quarterly*, no. 56 (First Quarter 2010), 152.

[68] Cole C. Kingseed, "The Pacific War: The U.S. Army's Forgotten Theater of World War II," *Army*, 63, no. 4 (April 2013), 50-6.

[69] Ibid, 53.

Beyond the latitude enjoyed by Japan during the interwar period allowing it to plant the seeds of an empire, the first two plus years of the European war effectively distracted the European imperialist nations with Asian and Pacific possessions. Seizing the opportunity presented by this situational reality, the Imperial Japanese Navy and Army attacked and took control of a considerable Asian-Pacific empire with surprising efficiency. Comprised of French Indochina, Dutch East Indies, Hong Kong, Singapore, Burma, and Malaya, these conquered lands offered Japan the natural resources it required to fuel its war machine. The scope and scale of these operations This initial string of successes would include the invasion of the American territory of the Philippines Archipelago, where MacArthur in 1941-42 was the senior US military commander. As eventual Japanese victory became more apparent in early 1942, President Roosevelt ordered MacArthur out of the Philippines to help plan and direct an element of the US' eventual war effort against Japan.[70] When he departed the archipelago for Australia, MacArthur made it plain that to recapture the Philippines was his strategic aim point. Thus, it became a lynchpin in the SWPA's strategic aims at the theater level. This fact, above all others, remains to the present day, the most contested aspect of MacArthur's role in the war against Japan.[71]

Multiple reasons have been and continue to fuel this controversial strategic matter. Some contain military merit, while many, if not most, emanate from inter-service rivalry, politics, and a simple dislike of MacArthur the man.[72] Analysts may make objective arguments that there were sound strategic justifications for retaking the Philippines in the narrow sense and for the

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[70] Staff of General Douglas MacArthur, *Reports of General MacArthur: The Campaigns of MacArthur in the Pacific,* vol. 1 (Washington, DC: Office of the Chief of Military History, Department of the Army, 1950), 20.

[71] Walter R. Borneman, *MacArthur At War: World War II in the Pacific* (New York: Little, Brown and Company, 2016), 399.

[72] Spector, *Eagle Against the Sun*, 71-5.

existence of the SWPA in general. A popular contention against both is the simple supposition that by establishing the SWPA and its operational advance north, the Roosevelt administration and his military and naval chiefs weakened the more considerable Pacific war effort and hamstrung the proper direction of advancement, which was with Adm. Nimitz in the Central Pacific theater.[73] But such an argument overlooks the fact that by concentrating its military and naval efforts on a narrow front or axis of advance, the Japanese could likewise focus their more finite manpower reserves and supplies and strengthen already imposing defenses. Also, by eschewing the South Pacific, Japan would have less hindered access to the vital natural resources of Southeast Asia, the resources fueling their war machine such as crude oil from Borneo.[74] Finally, by making greater use of its manpower and industrial advantages, the US, by waging war across a broader area, forced Japan to react to American initiative and disperse its meager military and naval resources, thus diminishing its capability and effectiveness.

Beyond the various and often complex military and naval strategic elements lurking in the background, as Clausewitz noted, were the ever-present political considerations and, in this instance, between the US and British Commonwealth.[75] This global conflagration made the US and United Kingdom (UK) inexorably conjoined. The strategic guidepost of Germany first versus that of Japan never came into question. While the preservation or security of Australia and New Zealand, both Commonwealth nations, represented critical strategic aims of the Pacific strategy, Great Britain, arguably and understandably from the proximity of its Nazi Germany and

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[73] Foster Hailey, *Pacific Battle Line* (New York: Macmillan, 1944), 215.

[74] Robert W. Love Jr., "Defeat of Japan," in *The West Point History of World War II: Volume 2*, ed. Clifford J. Rogers, Ty Seidule, and Steven R. Waddell (New York: Simon & Schuster, 2016), 221.

[75] Clausewitz, *On War*, ed. and trans. Michael Howard and Peter Paret (Princeton: Princeton University Press, 1976), 81.

Europe perspective, viewed US strategic and operational considerations in the war with Japan warily. Geo-politically, Australia and New Zealand, therefore, developed more profound and stronger ties to the US as the latter represented their best means of security from Japan's increasingly apparent southward advances and offered Chief of Naval Operations, Adm. Ernest King, and Gen. MacArthur, the most viable strategic basis to align with the domestic (US) view of Japan as a more tangible threat. This view emanated from the vitriol sentiment permeating the nation because of Japan's attacks and raids of December 1941.

Japan's overt strategic shift south and toward Australia and New Zealand held two significant considerations for the US and its allies. First, again, the preservation of the lines of communication and supply with Australia and New Zealand and thus inherently ensuring their security. Second, the US could not simply assume a strategic defense with the US Navy conducting hit-and-run aerial raids with intermittent, coordinated US Marines amphibious raids.[76] The South Pacific contains large island land masses, and the Australian continents require Army participation. These large land formations became crucial strategic aims and tactical objectives for Japan and the US.[77] In a rather interesting occasion of irony, the strategic situation forced King and the US Navy to curry army collaboration and strategic agreement, in the person of Army Chief of Staff Gen. George Marshall, to ensure the Pacific War (and the public spotlight on the US Navy in the fight to avenge December 7th), did not altogether fade to black in the shadow of the war against Hitler and Nazi Germany.

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[76] Morton, *Strategy and Command: The First Two Years*, (1962; repr., Washington, D.C.: Center of Military History, United States Army, 2000), 289.

[77] Ibid, 290

Furthermore, for MacArthur, Australia became a pivotal strategic and operational element. First, as an operational headquarters and logistical supply base supporting future operations. Second, as a projection platform to launch these intended future US and allied offensives. This fact became even more apparent and critical once the fate of the Philippines factored into the American strategic situation.

With command and operational structure matters addressed, although not definitively resolved, the US Army and Navy planners outlined operational plans to initiate offensives against Japanese-held South Pacific fortifications by late summer of 1942.[78] As Clausewitz might have surmised, the time arrived for the US Army in the SWPA to render strategy tangible.[79] That is, to move beyond the abstract and theoretical into the physical world, a reality. Clausewitz argued that strategy is ultimately only proper with operations, i.e., employing tactics against the enemy.[80] For MacArthur, the immediate objective codified in the ”Joint Directive for Offensive Operations in the Southwest Pacific Area” from the US Joint Chiefs was Japan’s primary operational and supply base at Rabaul on the island of New Britain.[81] To seize this harbor, its base, and airfields, SWPA and other US planners argued, effectively eliminated Japan’s ability to launch and, more importantly, sustain invasions of New Guinea, New Zealand, and Australia.[82]

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[78] Mark A. Stoler, *Allies, and Adversaries: The Joint Chiefs of Staff, the Grand Alliance, and U.S. Strategy in World War II* (Chapel Hill: The University of North Carolina Press, 2000), 70.

[79] Clausewitz, *On War*, ed. and trans. Michael Howard and Peter Paret (Princeton: Princeton University Press, 1976), 190.

[80] Ibid.

[81] John C. McManus, *Fire and Fortitude: The U.S. Army in the Pacific War, 1941-1943* (New York: Caliber Books, 2019), 260.

[82] Leo Hirrel, *The U.S. Army Campaigns of World War II: Bismarck Archipelago* (Washington D.C.: Center of Military History, United States Army, 1995), 3.

With Japan's spring of 1942 assault upon New Guinea, MacArthur decided the time right to move forward with active defensive operations, albeit limited owing to available resources and unit availabilities, and to do so on New Guinea.[83] This forward projection of the US and Australian formations onto New Guinea appears to be an offensive operation; it was, in practical terms, an active defense. MacArthur believing the initial operational plan associated with the protection of Australia too passive, decided to meet the Japanese advance on New Guinea and defeat them away from Australia.[84] New Guinea, in the fall of 1942, was and remained one of Earth's more geographically remote and what Army and Navy planners characterized as a pre-modern society, in the extreme.[85] Within that context, The SWPA's first US Army division, pushed into the foray, was the 32nd Infantry Division. A formation ill-equipped and inadequately trained at the time of this operation, SWPA headquarters tasked the 32nd with engaging a formidable enemy in a challenging operational situation.

Conducting modern combat operations in such a primitive setting illustrates well MacArthur's declaration that the conditional realities of the SWPA at the tactical level made it an "engineer's war."[86] Strategic concerns similarly emanated from this austere reality. New Guinea, the Bismarck Archipelago, the Solomons, and the balance of the Southwest Pacific islands or landmasses held no inherent strategic concerns of themselves. These islands had no essential

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[83] Staff of General Douglas MacArthur, *Reports of General MacArthur: The Campaigns of MacArthur in the Pacific,* vol. 1 (Washington, DC: Office of the Chief of Military History, Department of the Army, 1950), 45.

[84] Ibid.

[85] James Campbell, *The Ghost Mountain Boys: Their Epic March and the Terrifying Battle for New Guinea-The Forgotten War of the South Pacific* (New York: Crown Publishers, 2007), xv.

[86] Major Natalie M. Pearson, *Engineer Aviation Units In The Southwest Pacific Theater During WWII* (San Francisco: Tannenberg Publishing, 2015), 8.

strategic resources critical to either side's ability to continue the war outside potential naval harbors such as New Britain's Rabaul. What rendered these isolated geographic dots on a map important was that they lay astride the lines of communication and supply between the US and their South Pacific allies and for the simple reason that the enemy was there.[87]

The maritime reality of the Pacific War against Japan meant that this war would always be tactically and strategically subject to this truth. MacArthur or his predominately US Army-comprised SWPA headquarters staff were always cognizant of this inescapable fact, notwithstanding long extant inter-service rivalry.[88] MacArthur demonstrated this comprehension through his persistent requests to the US Joint Chiefs for increased naval support by expanded logistical shipping and more significant numbers of amphibious assault craft.[89] Nevertheless, MacArthur and the Americans were not mutually exclusive in working through this persistent quandary. The Japanese, too, had to work through the operational obstacles that shipping limitations imposed upon their expeditionary land forces.[90] The eventual success of amphibious landings or assaults and sustained land campaigns in the SWPA theater rested on which side could best reinforce and consistently sustain engaged land combat formations.

This situation, as it existed then in the summer and early fall of 1942, illustrates Clausewitz's argument that the primary intent of war is to impose one's will upon that of the opponent. In a strategic sense, these apparent small-scale and insignificant engagements in the

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[87] John C. McManus, *Fire and Fortitude: The U.S. Army in the Pacific War, 1941 – 1943* (New York: Caliber, 2019), 259.

[88] Morton, *Strategy and Command: The First Two Years*, (1962; repr., Washington, D.C.: Center of Military History, United States Army, 2000), 331.

[89] Ibid.

[90] McManus, *Fire and Fortitude* (New York: Caliber, 2019), 264.

backwater theater of the South Pacific held strategic consequences. Whether the increasing number of American victories tangibly influenced the Japanese national will to continue the war is debatable and difficult to gauge owing to the manipulation of wartime news by the Japanese government. However, that strategic consideration is irrelevant to the Americans' determination to prosecute the war. The definitive strategic goal of the war was the unconditional surrender of Japan. The US, and its allies, would continue with military and naval campaigns on an increasing trajectory until the achievement of that aim, apart from Japan's desire to carry forth. The nature of the strategic discussions between President Roosevelt and his military and naval chiefs occurring both before it entered the war and once the US became an active participant demonstrates the acknowledgment on their part of the nation's underlying visceral view of Japan emanating from the nature of the actions which brought about the war.[91] A situation that exemplifies another Clausewitz postulates that "war is affected by the specific characteristics of the states in conflict, and by the general characteristics of the time, those being political, economic, technological, and social elements."[92]

Public pronouncements and strategic directives published as written orders to a theater, or geographic commanders appear direct enough, especially in historical hindsight. However, for MacArthur to realize his vision of the desired end state and, in a larger sense, American and

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[91] Memoirs of American leaders such as Roosevelt and Marshall contain within their papers accounts of discussions, both private and offered for public consumption the concept of German and Japanese surrender as the basis of Allied war policy. Specifically see, "Revised Minutes of Meeting, Held at Anfa Camp on Monday 18th January 1943 at 1700," Box 26, Anfa Conference (Casablanca), Vol.1 Minutes, Franklin D. Roosevelt, Papers as President: Map Room Papers, 1941 – 1945, Franklin Delano Roosevelt Presidential Library and Museum, 2011, mr0116.pdf (marist.edu) and *The Papers of George Catlett Marshall,* ed. Larry I. Bland and Sharon Ritenour Stevens (Lexington, Va.: The George C. Marshall Foundation, 1981–). Electronic version based on *The Papers of George Catlett Marshall,* vol. 3*, "The Right Man for the Job," December 7, 1941–May 31, 1943,* Baltimore, and London: The Johns Hopkins University Press, 1991), pp. 29–31

[92] Peter Paret, "Clausewitz," in *Makers of Modern Strategy: From Machiavelli to the Nuclear Age*, ed. Peter Paret (Princeton, NJ: Princeton University Press, 1986), 199.

Allied strategic aims required creative thinking and utilization of his limited manpower and munitions in targeted operations offering the most significant promise of success. The inescapable fact of the situation throughout 1942 for the men of the SWPA was that they needed to be on equal footing with the Navy about the wider Pacific War, logistically speaking. The SWPA, as it were in operational reality, was its war or area of operations and was third, at best, on the prioritization list. Looking at this situation in the SWPA, then from the Army's functional branches, MacArthur, his planners, and tactical leaders needed to maximize those capabilities immediately.

The US Army's strategic and tactical situation at hand in 1942, while problematic in many ways, represented an opportunity for the service's engineers in their effort to not only expand its operational role but more fully develop its role(s) within the revolution of warfare in a broad sense and as it pertained to the contextual realities and requirements of the SWPA. Naturally, the evolution of engineer doctrine and tactical roles did not occur solely in the test lab of stateside training centers. However, that comprised a relative part of this transition and subsequent chapters of this work.[93] The engineers demonstrated their critical combat role naturally first during the Americans' and Filipinos' defensive operations against Japanese formations on Luzon beginning in 1941 and up to the capitulation of May 1942, with their early tactical priorities being the counter-mobility (the disruption or restriction of the ability to move tactically) of Japanese formations and demolitions preparations of existing bridges.[94] The scant amount of engineer soldiers and units available at that time not only performed their traditional

[93] Karl Dod, *United States Army in World War II: The Technical Services: The Corps of Engineers: The War Against Japan*, (1966; repr., Washington, D.C.: Center of Military History, United States Army, 1987), 136.

[94] McManus, *Fire and Fortitude* (New York: Caliber, 2019), 91.

role of obstacle and trench or fighting position construction but likewise performed the role of an infantry soldier.[95] The persistent scarcity of Army combat units, from the battalion to division level, made it academic for MacArthur and his Chief Engineer, Major General (Maj. Gen). Hugh Casey, to repurpose engineers as explicit combat troops, such as their role in the Milne Bay engagement in August of 1942.[96]

These vignettes represent a fraction of the operational and tactical experiences of the engineers within the larger strategic context. For MacArthur to wrest the initiative away from the Japanese in 1942 or 1943 by refusing to simply construct and occupy extensive, passive defensive positions in Australia proper and effectively push the Australian (and New Zealand) defensive perimeter out to New Guinea principally required considerable planning and execution from Casey and his SWPA engineers.[97] MacArthur's strategic intent was to alter the Japanese center of gravity, to knock them off balance both strategically and tactically, and induce them to react to his active defense, allowing the US Army to seize the strategic and tactical initiative in the SWPA theater.[98] In the broader Pacific strategic sense, the US following the successful naval engagements of the Coral Sea and Midway, Adm. Chester Nimitz, Commander in Chief of the US Pacific Fleet, by the US Joint Chiefs' directive, initiated a simultaneous and mutually supportive operation against the island of Guadalcanal in the Solomon Islands.[99]

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[95] Louis Morton, *United States Army in World War II: The War in the Pacific: The Fall of the Philippines*, (1953; repr., Washington, D.C.: Center of Military History, United States Army, 1993), 406.

[96] Samuel Milner, *United States Army in World War II: The War in the Pacific: Victory in Papua*, (1957; repr., Washington, D.C.: Center of Military History, United States Army, 2003), 84.

[97] Staff of General Douglas MacArthur, *Reports of General MacArthur: The Campaigns of MacArthur in the Pacific,* vol. 1 (Washington, DC: Office of the Chief of Military History, Department of the Army, 1950), 35.

[98] Ibid.

[99] Morton, *Strategy and Command: The First Two Years*, (1962; repr., Washington, D.C.: Center of Military History, United States Army, 2000), 302.

The American situation in 1942 was complex, to be sure, when breaking it down to its fundamentals remained, at least tactically, as Clausewitz noted a geometry problem.[100] Whether it was a foregone conclusion that the US would emerge victorious in the war against Japan once initiated has and will remain a subjective debate and outside the scope of this study. There is, however, an amount of certainty associated with the degree of overwhelming US material and manpower supremacy when and if it so chose to make use of them. Thus, it became a matter of moving men and material to the theater of operations and maneuvering those assets within that theater and as an operational element. Again, the inherent capabilities and doctrinal role of the US Army's engineers made operational plans tactically plausible in the pursuit of strategic aims. For reasons identified in this chapter, the Pacific War was primitive compared to combat in European and Mediterranean theaters. It was devoid of armored engagements or capability. It would be a war characterized by small-scale, close-order infantry combat. Nevertheless, it still required combined arms and the freedom of maneuver for army formations at all echelons or organizational levels.

There is another element associated with the strategic and tactical levels of war that historians and analysts touch upon but rarely explore in detail, at least within the context of World War II. Seismic military and naval munitions technology revolutions occurred during the interwar and war periods. Air power progression was incredibly transformative as the newest element of combat operations. Early airpower proponents such as the US Army's Gen. Billy

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[100] Clausewitz, *On War*, ed. and trans. Michael Howard and Peter Paret (Princeton: Princeton University Press, 1976), 214.

Mitchell incurred the wrath of many of his fellow officers with his proposition that air power alone could achieve strategic aims.[101]

The Pacific War demonstrated that the US Army and Naval establishments must modulate in the strategic sense Mitchell and those sharing this contemporaneous idea. Nevertheless, this war did establish that mastery of airspace within a given theater or area of operations is critical as part of this evolving combined arms operational doctrine. Thus, throughout the SWPA, tactical air superiority became an ever-present and essential component of MacArthur's operational design for each succeeding assault. Pearl Harbor, Coral Sea, and Midway demonstrated the critical nature of aerial operations as part of modern naval engagements. What all these tactical conflagrations led to was both sides analyzing Pacific islands for port suitability in support of maritime operations and terms of existing or potential airfields. The engineers were essential to this element for MacArthur and SWPA planners and commanders. While construction and maintenance of land or island airfields fell within the scope of the service or technical support units of the Army's engineer branch, there were combat engineer considerations. From supporting the seizure of existing airfields as part of a combined-arms assault formation to protecting existing airfields within US operational control with obstacles and prepared fighting positions, the combat engineers again demonstrated their operational flexibility in achieving tactical success locally but in the broader strategic realm.

Another element of the operational and tactical component of the war within the SWPA warranting some acknowledgment is that of the Army's engineers on the broader framework. This study's narrow and explicit focus is the combat role, direct enemy engagement, and individual responsibility of amphibious operations of the engineers. No disparaging intent exists

[101] Robert T. Holritz, "Air Force: The Quest for Autonomy," *Flying Safety* 53, no. 9 (September 1997), 14.

with the omission within that parameter to marginalize the vital strategic and tactical contributions of the more traditional engineer capabilities. The branch's technical units concerned with theater construction, map production, pipeline operations, railway operations, and forestry contributed significantly to the US Army's global war effort. The industrialization of conflict by this time made an inherent reality of war, that of logistical supply and operational bases (a position from which to project organized combat power) more critical than in history. Realization of effective support results from significant support infrastructure. This infrastructure requires technical engineer planning and operations.

However, as noted previously, the nature of contemporary combat, especially in austere environments, rendered indispensable the multi-faceted capabilities of the branch's combat units. It is remarkable to accomplish this in such an environment and at a considerable distance from the United States proper. Historiography of the war has slightly breached but not exhaustively examined through the lens of the evolution of the Army's combined arms doctrine, most notably in the SWPA.

A subsequent chapter within this work analyzes the combined arms nature of MacArthur's SWPA operations touched upon throughout the preceding discussion. There is one other aspect or element of the tactical and strategic consideration of the SWPA that emerged in 1942 and more fully developed throughout the war, joint operations. Before moving forward with a brief discussion of this concept and its strategic and tactical association with the SWPA theater in general and the combat engineers specifically, the distinction between joint and combined operations warrants some discussion.

Combined operations utilize the various capabilities or branches of military or naval service in pursuit of local, specific functions or sustained theater-level campaigns. Therefore, for

this study, combined operations focus on including combat engineers operationally alongside the army's infantry, armor, artillery, and other military specialties. Conversely, the characterization of joint operations is the incorporation of multiple branches into the operational design under the command of a single commander from one of the incorporated services.[102] While this is tactical in execution, the nature of joint operations is more significant in scale. It has a more significant strategic impact relative to the given process's objective. At the same time, joint missions permeate American national defense operations in the present, but at the onset of World War II, this was not the case.

Bitter rivalry characterizes the relationship between the US Army and Navy at the onset of World War II. It was an entrenched sentiment that the researcher of this war might view as a rite of passage for members of each service and especially within the respective commissioned officer ranks in this period of American military and naval history. The absence of qualified operational doctrine, legislation, or presidential directive requiring collaborative efforts under a single commander and staff reared its head from the opening minutes of the conflagration. The Army and Navy's inability or unwillingness to fully integrate operations and command activities significantly contributed to the Japanese tactical success in their Pearl Harbor raid.[103] This contention, ingrained within commanders throughout the respective chains of command, eventually receded to varying operational functionality levels with the war's progression and global situational realities.

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[102] United States Army, *FM 3-0: Operations*, (Washington, DC: Headquarters, Department of the Army 2022), 252.

[103] Marc C. Jeter, "A Matter of Accountability: Communication and Coordination Failures Proceeding Pearl Harbor," to *Bound Away: The Liberty Journal of History*, Vol. 5: Iss. 2, Article 4. Available at: https://digitalcommons.liberty.edu/ljh/vol5/iss2/4.

Within the SWPA specifically, strategic, and tactical veracities made Army and Navy joint operations a foregone conclusion. The projection of American military power into the SWPA, especially at the strategic level, necessitated naval transport. At the tactical level, movement, and maneuver from transports onto the land or island objectives were initially viewed as a naval role and required army support.[104] Hence the development of the amphibious role with the Army's combat engineers contributing.[105] MacArthur, for his part, quickly ascertained the need for an enduring operational partnership between the Army and Navy in securing tactical objectives and strategic goals at the theater and national levels.

Before the Army and Navy could perform effective joint operations, it required joint training. Naturally, the vision of joint training often comes to mind as enlisted soldiers and sailors learning and achieving their individual and collective expected combat and support roles. But it also required respective service commanders and staff to train similarly.[106] Of note, the Australian Army conducted much of the army's initial amphibious training in the SWPA, the latter already having conducted such operations.[107] It warrants mentioning that preparations consisted of more than refinement of combat actions by these soldiers and sailors. The absence of any form of joint Army-Navy tactical doctrine represented a significant obstacle, both at the tactical and operational design levels, and both had strategic implications. That reality was not

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[104] Dod, *The Corps of Engineers: The War Against Japan*, (1966; repr., Washington, D.C.: Center of Military History, United States Army, 1987), 160.

[105] Brigadier General William F. Heavey, *Down Ramp! The Story of the Army Amphibian Engineers*, (Washington, D.C.: 1947), 1.

[106] William F. McCartney, *The Jungleers: A History of the 41st Infantry Division*, (Washington, D.C.: Infantry Journal Press, 1948), 28.

[107] Ibid.

exclusive to Army-Navy joint amphibious operations but a situation applicable to each US service internally and jointly. Holzimmer conveys that it is remarkable how successful joint operations in SWPA came to be within the context of the preexisting obstacles, not the least of which was the simultaneous performance of combat operations.[108] From Holzimmer's perspective, at least within the SWPA, MacArthur warrants considerable credit due to his implemented amphibious or joint command structure.[109] Senior naval leaders within the SWPA charged with working alongside MacArthur and the Army must also garner accolades.

Examination of this element should include the degree of impact on American and Allied success in the war, not only in the SWPA and the Pacific but across every theater of World War II. Again, from the context of the SWPA, US Army and Navy leaders up and down the respective chains of command demonstrated an elevated level of professionalism by overcoming not only their service biases but also operational execution. As noted at the opening of this chapter, every military and naval operation is inherently complex and challenging to relative degrees. Joint operations, especially amphibious types, represent a higher difficulty level. For the Army's combat engineers in 1941-42, as discussed in a subsequent chapter, it meant an altogether new tactical capability or responsibility the army's engineers had to organize, staff, and equip from nonextant to fully capable and operational amidst a world war.[110]

There is one other element of war applicable to each level that historians and authors overlook beyond that of strategic-level leaders. Leadership in the operational execution,

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[108] Kevin C. Holzimmer, "Joint Operations in the Southwest Pacific, 1943-1945," *Joint Force Quarterly: JFQ*, no. 38 (Third Quarter, 2005), 102-3.

[109] Ibid.

[110] Coll, Keith and Rosenthal, *The Corps of Engineers: Troops and Equipment*, (1958; repr. Washington, D.C.: Center of Military History, The United States Army, 2002), 360.

especially at the tactical level of war, is that element. An analysis of America's Pacific War experience, specifically within the SWPA, illustrates the critical contributions made by US combat leaders up and down the chain of command. William Stofft argues for the pivotal role applicable to SWPA by noting the fundamental operational nature of leadership to apply to "land, sea, and air" components.[111] World War II historiography overwhelmingly focuses on the implication of tactics and their successes or failures as if they impose their results outside human intellectual design and implementation. Therefore, the operational or tactical level of war analyzed in this context contradicts Clausewitz's supposition, as Peter Paret explained that war is an inherent element of human existence.[112] War may have a unique nature comprised of relative components, but it cannot inflict violence and carnage outside the will of human beings.

For the US Army and its combat engineers in the SWPA, human intellect and action at the tactical level were necessary to achieve the given strategic objectives. The US had industrial, material, and manpower advantages over Japan, but transforming this potential into tangible battlefield success required superior leadership. As noted, the combat engineers had to develop and refine tactics, techniques, and procedures suitable for the operational conditions of the SWPA theater. Necessity bore the correlating evolution of leadership for the appropriate and effective implementation of new equipment and tactics. Stofft touches on a trait of war that historians discuss as a situational reality but do not extrapolate and analyze as an influencer. That trait is adversity.[113]

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[111] William Stofft, "Leadership at the Operational Level of War," in *On Operational Art*, ed. Clayton R. Newell and Michael D. Krause, (Washington, D.C.: Center of Military History, United States Army, 1994), 189.

[112] Paret, "Clausewitz," in *Makers of Modern Strategy*, ed. Peter Paret (Princeton, NJ: Princeton University Press, 1986), 204.

[113] Stofft, "Leadership at the Operational Level of War," in *On Operational Art*, ed. Clayton R. Newell and Michael D. Krause, (Washington, D.C.: Center of Military History, United States Army, 1994), 190.

Adversity at the strategic and tactical level of war is universally present in wartime operations. Military and naval planners' effective operational design aims to account for multiple eventualities. The reality, however, requires adjustment of the theoretical (operational design) in the application (tactics) once the fight begins. Coherent leadership at a given point and time on the battlefield means achieving this. Coll, Keith, and Rosenthal convey that the engineer branch's senior leaders, such as the Assistant Chief of Engineers Brig. Gen. Clarence L. Sturdevant, in charge of training, lamented the shortage of quality officers at the war's outset. [114] Sturdevant bluntly stated his position that for engineer units at each level to be effective and support national strategic aims, large numbers of high-grade officers were necessary.[115]

Daunting is the most succinct adjective to characterize the strategic realities and operational tasks confronting Gen. MacArthur and the officers and soldiers of the SWPA throughout the Pacific War. Yet by the late summer of 1945, they accomplished their tactical and strategic objectives resulting in victory over Japan. This accomplishment required them to identify, implement, and refine new practices and means of conducting land warfare in an oceanic region. Methods and means needed them to work more intimately with their inter-service rivals, the US Navy than had occurred previously in American military and naval history. Within the branches of the US Army, such unique topographical realities required adaptation of operational means, but none more than with the service's engineers. This branch's doctrinal tenet of ensuring the tactical maneuverability of the infantry, engineer senior leaders assessed as never before. For this to reach fruition, the Army had to adjust combined arms practices and, in some instances, construct them from naught. Combined with the scope and scale of a worldwide war,

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[114] Coll, Keith and Rosenthal, *The Corps of Engineers: Troops and Equipment*, (1958; repr. Washington, D.C.: Center of Military History, The United States Army, 2002), 146.

[115] Ibid.

the Army needed to properly induct officers and enlisted engineers into the service's engineer branch and prepare through rigorous training and education for this daunting odyssey.

Chapter III:

US Army and Combat Engineer SWPA Organization and Combined Arms Operations

World War II was, in every sense, indeed a world war, with every topographical and climatic feature or event influencing operational plans and execution. The islands and waterways comprising the SWPA were unique in comparison to the other operational theaters of the war. What rendered them atypical in this context, and thus influenced US Army SWPA organizational composition and functional design, was that the islands of the Pacific consisted of diminutive land masses that constricted maneuverability. Rugged, mountainous features, thick jungle foliage, or soils and beaches are often too unstable to support the weight, and thus utilization of modern munitions technology characterized the islands of this region.[116] Added to those realities were the constant, elevated temperatures correlating to high humidity and extended periods of heavy rainfall, which affected tactical implementation.[117] The SWPA represented an austere and isolated theater compared to other areas of operations. However, missions still required SWPA planners and commanders to utilize each of the Army's combat and service (or support) branches to the greatest extent possible. Furthermore, do so in a combined arms fashion to maneuver throughout the battlespace, provide the requisite supply activities, and conduct the combat operations to defeat Japan.[118] Such operational veracities elevated the profile of the US Army's

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[116] Dr. Gilbert Grosvenor, "New Guinea No Island Paradise to Yanks Fighting in Nightmarish Wilds," *The Sunday Star* (Washington, D.C.), July 9, 1944, Library of Congress, ttps://chroniclingamerica.loc.gov/lccn/sn83045462/1944-07-09/ed-1/seq-39/

[117] Samuel Milner, *United States Army in World War II: The War in the Pacific: Victory in Papua*, (1957; repr., Washington, D.C.: Center of Military History, United States Army, 2003), 56.

[118] Colonel O.H. Saunders, "Task Forces," *Military Review* XXI, no. 83 (Fourth Quarter 1941), 18-19 and United States Army, *FM 100-5, Field Service Regulations: Operations,* (Washington, D.C.: United States Government Printing Office, 1941), 3-4.

engineers, where the constant, elevated temperatures with correlating high humidity and extended periods of heavy rainfall were inherent operational considerations.

Army unit organizational structure emanates from its functional utilization. Functional structure is a truism associated with the US Army of World War II and universally with every Army throughout history. Gen. MacArthur in the SWPA faced operational realities that differed from his theater-level peers in the war. These operational realities held significant structural and, therefore, doctrinal challenges for the US Army's various branches, especially for the engineer branch.[119] Compounding this challenging reality was that the US Army had prepared, in every way, to fight a more technologically modern, mobile German Army on the European continent.[120] While that remained the US Army's operational priority, incorporating a significant active role in the war against Japan forced greater tactical flexibility as much if not more than, broad doctrinal evolution in a highly constrained period.

The soldiers of the SWPA command underscored the means and methods of fighting that war in that time and space. This dissertation scrutinizes specifically the soldiers of the US Army's engineer branch and, more explicitly, those assigned the roles and responsibilities of a combat engineer within the engineer branch. Soldiers, sailors, airmen, and marines encompass the "tip of the spear" when fighting a war; their collective characteristics and, most importantly, speaking and training researchers often afforded scant discussion or omitted altogether. However, preceding the training element of these future Pacific War combat engineers, the US Army had to logically and effectively organize or structure itself at the tactical level of war.

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[119] Office of the Chief of Engineer, Major General Hugh Casey, *Engineers of the Southwest Pacific 1941-45, Volume I*: *Engineers in the Theater Operations*, Reports of Operations United States Army Forces in the Far East, Southwest Pacific Area, Army Forces Pacific, 1947, 65.

[120] Blanche D. Coll, Jean E. Keith, and Herbert H. Rosenthal, *United States Army in World War II: The Technical Services: The Corps of Engineers: Troops and Equipment*, (1958; repr., Washington, D.C.: Center of Military History, United States Army, 2002), 12.

Regardless of the climatic, topographical, and enemy capabilities to be experienced by the US Army in the theaters of war, the freedom to move to and throughout the battle space while simultaneously impeding the enemy's ability to do so remained the combat engineers' foundational assignment.[121] These foundational engineer activities, known in military parlance as mobility (friendly) and counter-mobility (enemy), are by necessity relative to topography, weather, and enemy or opposing forces characteristics. Throughout the world's respective national militaries, operational theory experienced significant changes during the interwar period. The US Army was no different despite a common perception of the service being unimaginative in doctrinal and technological progression due to budgetary constrictions. There was a culture of adaptation and advancement during this era, beginning with the often-overlooked Army Chief of Staff, Gen. Malin Craig, of the mid-1930s.[122] Coll, Keith, and Rosenthal, in their volume on the *U.S. Army in World War II* series analyzing the engineers' soldiers and equipment, hypothesize that Gen. Craig intended to make the US Army more tactically flexible and mobile. He did this, they surmise, by initiating the Army's adoption and utilization of advanced technology or "mechanical" opportunities.[123] This transformative process launched by Craig attained maturation in his successor's (Gen. Marshall) tenure while fighting World War II. This organizational transformation began with the principal operational or tactical

[121] Lieutenant Colonel (LTC) Arthur G. Trudeau, "Mobility and Motors," *Military Review* XXII, no. 84 (April 1942), 22.

[122] Coll, Keith, and Rosenthal, *The Corps of Engineers: Troops and Equipment*, (1958; repr. Washington, D.C.: Center of Military History, The United States Army, 2002), 12.

[123] Ibid.

formation, which was traditionally the infantry division in the years preceding the onset of the war and US entry.[124]

1939 proved to be a pivotal year for Army organization and structure. Infantry divisions throughout the interwar period remained structurally as they had in 1918. Known as a square division, it was a large, infantry-laden structure with scant incorporation or intention of maximizing the utilization of modern transportation means. Such a structure and correlating doctrine aimed to fight large-scale and static campaigns. A legacy doctrinal view from the Army's World War I experience on the Western Front. This structure not only dictated or influenced infantry doctrine but, in a cascading fashion, affected all the branches and functions associated with the square infantry division, from dictated supply processes and means of communication. What an infantry division commander required of the engineers and how they performed their tasks dictated that the Army either transformed existing engineer units or fashioned altogether new units to address newly identified tactical needs.

In the years preceding the outbreak of World War II, those within the US Army, conscious of the world situation and the progression of military technology, argued for advancing the Army's means and methods.[125] For the Army's engineer branch, senior leadership foresaw an escalation of its combat responsibilities to be necessary on the modern battlefield.[126] As the Army sought to infuse greater mobility throughout its formations and capabilities, it began with the structure of the infantry division. The square division composition gave way to the lighter

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[124] United States Army, *FM 100-5, Field Service Regulations: Operations,* (Washington, D.C.: War Department, 1941), 2-3.

[125] Williamson Murray and Allen R. Millett, *A War to Be Won*: *Fighting the Second World War*, (Cambridge, MA: The Belknap Press of Harvard University Press, 2000), 30.

[126] Coll, Keith, and Rosenthal, *The Corps of Engineers: Troops and Equipment,* (1958; repr., Washington, D.C.: Center of Military History, The United States Army, 2002), 14.

and nimbler, its proponents supposed, triangular arrangement. The Army achieved, theoretically, this dexterity by eliminating one of the square division's infantry regiments.[127] This reduced the personnel strength requirement of the triangular division and a corresponding contraction of the division's organic engineer configuration.

The authorized triangular division's total war-time strength was 13.552, a 4% reduction from the approved square division's traditional end strength.[128] The corresponding decrease in the division's engineer formation left the triangular division commander with support from a battalion instead of a regiment. Interestingly, some planners believed the opposite despite the engineers' contention that greater reliance upon wheeled and tracked vehicles held a correlating requirement for substantive engineer support to ensure mobility. That increased vehicular mobility diminished the role of engineers.[129] The Army's supposition for enhanced flexibility and mobility because of this structural alteration led others within the Army and civilian officials (members of the US Congress) to question the combat power and tactical effectiveness of this streamlined organization. Others, such as historian Russell Weigley have questioned the rationale behind what he contended was the Army's procrastinated structural transition. He supposed that the Army's protracted and, by the mid-twentieth century, misplaced emphasis on firepower instead of enhanced mobility as it related to modernization.[130] However, such a conclusion appears amiss when examined against the historical record. Gen. Craig's explicitly defined end-

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[127] Mark S. Watson, *United States Army in World War II: The War Department: Chief of Staff: Prewar Plans and Preparations*, (1950; repr., Washington, D.C.: Center of Military History, The United States Army, 2003), 158.

[128] Ibid.

[129] John B. Wilson, "Mobility Versus Firepower: The Post-World War I Infantry Division," *Parameters* XIII, no. 3 (September 1, 1983), 51.

[130] Russell F. Weigley, "Shaping the American Army of World War II: Mobility Versus Power," *Parameters* XI, no. 3, (September 1, 1981), 14.

state demonstrated that the Army, or at least its more prominent leaders, did not view these capabilities as mutually exclusive.

The Army did not limit technological advancements to vehicles, tanks, and munitions assigned to infantry or armor formations. Engineer tools and equipment likewise experienced an evolution in the years immediately preceding the war. The reduction from a regiment to a battalion is more palatable. For the engineers of the SWPA, this consideration was less significant as the nature of the region relegated warfare to an infantry-intensive, close combat experience that required combat engineers to utilize their traditional hand tools such as shovels and pickaxes. Combat lessons from German Army campaigns in Europe drove the US Army's metamorphosis in technology and methodology applicable to its subsequent operations in North Africa and Western Europe. For the US Army's engineers faced with the unique problems presented on the islands of the Southwest Pacific, the requirement remained the training and skills of the individual engineer soldier and collectively as a unit.

While the US Army undertook and completed a remarkable process of structural and technological transformation before and during the war, in a practical sense, alterations such as the migration from the square to the triangular division were diminutive to the soldiers and operations in New Guinea or New Britain. Narrowly, for the combat engineers, refashioning consisted of tailoring methods appropriate to the topography of a precise mission area while meeting the local combatant commander's intent for that mission. This situation necessitated close work between the Army Ground Forces (AGF), Army Service Forces (ASF), and the Office of the Chief of Engineers.

AGF held responsibility for the formal organization and training of the Army's designated combat units. The Army, in 1940, categorized combat units as those having

operational roles and activities intended to engage enemy formations or complete their requisite activities while engaged in enemy contact. The infantry, artillery, and cavalry (or armored force) were the principal and most apparent combat arms. Less obvious is the recognition of the engineer branch as a combat arms cohort.[131] As noted across official Army doctrine, supplemental publications of the era, and by individual observers of military arts, this responsibility of the US Army's engineers was prominent. The US Army in the SWPA could only defeat the enemy, in this case, Japanese soldiers, Marines, or other service personnel in the context of close ground combat and with the restricted ground to maneuver.[132] The Army's infantry soldiers and units had to physically place themselves in a favorable position to engage and defeat the Japanese. In a broad sense and in most operational instances, that reality required the combat engineers' front-line presence, skills, and tools. Within the Army's wide engineer consortium, those unit "types" assigned to AGF were (amphibious) brigades, Combat regiments, and battalions, armored (engineer) battalions, Heavy Pontoon battalions, Light Pontoon companies, Camouflage battalions and companies, Topographic battalions and companies, Water Supply battalions, Depot companies, and maintenance companies.[133]

The popular and academia's historiographical focus has been and continues to be on the combat branches. The reasons for this are numerous and obvious, but that is an analytic pursuit that diverts the proper course of this study. Whereas AGF was the proponent for the

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[131] The War Department, The Army of the United States: Its Components, its Arms, Services, and Bureaus, its Military and Nonmilitary Activities, Prepared by the War Department for Morris Sheppard, Chairman of the Committee on Military Affairs of the Senate, 76th Cong., 1st sess., S. Doc. 91, June 7, 1939, 51.

[132] Trudeau, "Mobility and Motors," *Military Review* XXII, no. 84 (April 1942), 24.

[133] Coll, Keith, and Rosenthal, *The Corps of Engineers: Troops and Equipment,* (1958; repr., Washington, D.C.: Center of Military History, The United States Army, 2002), 222.

organization's combat units, the Army had and has an even greater pool of support units. During World War II, the Army Services Forces (ASF) Command held responsibility for these soldiers and units' organization, structure, and training. Transportation, Supply, Adjutant General (personnel), Medical, Military Police, and Finance branches, while not expected to engage in persistent, direct combat, were no less valuable and critical to Army successes.[134] The engineers, again owing to their multiplex responsibilities, also had unit types within the purview of the ASF. These formations consisted of General and Special Service regiments, Separate battalions, Dump Truck companies, Forestry companies, Petroleum Distribution companies, Port Construction, and Repair groups, Topographic battalions, Equipment companies, Base Shop battalions, and Heavy Shop companies.[135] In overly simplistic terms, the engineer units within the charge of the AGF were those units Coll, Keith, and Rosenthal identify as having responsibility for "direct" support to combat units.[136] The service branches of the US Army, then and now, provide the necessary activities and support that the combat branches require but do not have the latitude or personnel to perform such tasks. Time is a finite resource; within the milieu of military operations, it is even more bounded, making it necessary for the relief of combat branches from burdensome but critical administrative and logistical activities by other branches (units) having a narrow and specified responsibility or specialty, one might say, correlating to each specific function. With the war's progression and lessons learned from combat operations, the Army, in 1944, bifurcated ASF units further into combat service support units and service support units. The distinction

[134] United States Army, *FM 100-5, Field Service Regulations: Operations,* (Washington, D.C.: War Department, 1941), 5.

[135] Coll, Keith, and Rosenthal, *The Corps of Engineers: Troops and Equipment,* (1958; repr., Washington, D.C.: Center of Military History, The United States Army, 2002), 222.

[136] Ibid.

between these unit structures rests with the former conducting their respective combat "zones" operations. At the same time, the latter performed their missions in what the Army termed the communications zone or rear area.[137]

While AGF and ASF held service-wide or strategic level responsibility for their respective branches in a broad and collective sense, there existed the requirement that they work in consort with the administrative hierarchy associated with each branch, whether a combat arm or service unit. Each of the Army's branches during World War II had a nominal "chief" of the respective arm or service.[138] These chiefs were flag (General) officers who did not exercise operational or mission command over the soldiers and units of their branches. Through their respective staff, their role was to identify and develop the tactics, techniques, procedures (known collectively as TTP), requisite specialized training, and equipment associated with their branch.[139] Situated in Washington, D.C., these branch chiefs also served as advisors to the Army Chief of Staff concerning matters affiliated with their respective branches.

The Office of the Chief of the Corps of Engineers was unique compared to his peers. While this officer held the same staffing, training, and equipping responsibilities identical to the other branch chiefs, this position also had responsibilities for the civil works mission of the Army's engineer component.[140] None of the Army's other arms or services held various roles across the military and civilian realms. This peculiar dual functionality did not directly affect

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[137] Ibid, 223.

[138] The Army of the United States: Its Components, its Arms, Services, and Bureaus, its Military and Nonmilitary Activities, 76th Cong., 1st sess., S. Doc. 91, June 7, 1939, 54.

[139] Ibid, 56.

[140] Coll, Keith, and Rosenthal, *The Corps of Engineers: Troops and Equipment,* (1958; repr., Washington, D.C.: Center of Military History, The United States Army, 2002), 4.

either the structure or operations of the combat engineers in the SWPA; it did affect the availability and preparedness of engineer soldiers and officers.[141]

Despite deliberate plans, programs, and implementation of the nation's first peace-time draft, the engineer branch, like the entire Army, suffered from severe personnel shortages at the war's onset.[142] A considerable segment of the Army's engineer officers served in a construction (civil) works capacity in 1941, a situation that the engineer branch would have to refashion to duly perform its multifaceted position on the Army team and in varying conditions throughout the near entirety of the globe. The engineer branch habitually received the top graduates from the United States Military Academy at West Point, New York. With the Army's large-scale expansion from 1940 onward and the emphasis on strengthening the service's critical combat arms, particularly the infantry, artillery, and newer tank or armored formations, the Corps of Engineers could no longer anticipate receiving those more distinguished cadets.[143] No, the engineers, like the balance of the Army, would need to rely on other pre-commissioning preparatory programs and, due to the context of the times, more expedient means by which to source the officers responsible for leading engineer soldiers and units into combat—a quick note concerning this aspect of the Army's and engineers' World War II experience. While quantitative analysis of the actual numbers may offer some statistical validation to this discussion, it is unnecessary within the parameters and intention of this work. The notation of this matter is to aid with establishing

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[141] Ibid, 146-60.

[142] C.L. Sulzberger, *American Heritage: New History of World War II*, rev., and ed. by Stephen E. Ambrose (New York: Tess Press, 2009), 113.

[143] Coll, Keith, and Rosenthal, *The Corps of Engineers: Troops and Equipment,* (1958; repr., Washington, D.C.: Center of Military History, The United States Army, 2002), 146.

the much broader context of the military situation at the time of the US entry into the war and is an element of the branch's wartime evolution as analyzed throughout this project.

This topic was no less concerning recruiting and training individual soldiers and configuring engineer units. The unyielding demand for soldiers, specifically those demonstrating a propensity for the requisite skills unique to the engineer branch, was a Herculean program for the branch's executive administration. Exasperating this personnel dilemma for the engineers was the emerging operational capabilities and the imposition of developing doctrine for and composition necessities of new units.[144] For many reasons, the engineers performed the parental role for the embryos of unique formations such as Army amphibious units.

Engineer soldier training (individual) occurred at two primary locations during World War II. Fort Belvoir, Virginia, was the branch's "home" at this time, with a second engineer training site established at Fort Leonard Wood, Missouri.[145] In the spring of 1943 and through the summer of 1944, the engineers found a supplemental individual training site, Camp Abbott, Oregon, to help fill operational needs and relieve the pressure at Belvoir and Wood brought on by large numbers of trainees.[146] Beyond basic entry training, a program that every enlisted soldier completed regardless of their eventual specialty, engineer soldiers proceeded to their respective specialized training. The massive influx of soldiers into the Army and its facilities leading up to the US entry into the war was subsequently welcome. Still, the need to fill units

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[144] Ibid, 158.

[145] Headquarters, Army Ground Forces, Office of the Commanding General. *Report of Activities, Army Ground Forces, World War II*, (Washington, D.C.: U.S. Government Printing Office, 1946), 24-25.

[146] Coll, Keith, and Rosenthal, *The Corps of Engineers: Troops and Equipment,* (1958; repr., Washington, D.C.: Center of Military History, The United States Army, 2002), 249.

and support commanders across the globe led to concerns and questions most notably associated with the nature and duration of training.

The overarching concern and need emanating from primary sources associated with this matter, and in this period, was for soldiers to fill unit rosters and allow for the utilization of those units in operations against the forces of the Axis nations. Gen. Marshall and the Roosevelt administration had been overseeing a deliberate build-up of the Army and other services, but Japan's prodigious raids of 7 and 8 December 1941 changed everything. That included upsetting the US mobilization planned program and correlating timelines. The Army's engineers were no less and possibly more afflicted than the balance of the US Army with the arrival of 1942.

As Coll, Keith, and Rosenthal imply throughout their overview of the engineer branch's wartime expansion, the impression is that the Army, in general, was, in an oversimplified characterization, grasping about in its effort to meet the demands of the dramatically altered worldwide situation. The engineer branch, especially with their general and technical military occupational skill requirements, floundered through 1942 as the administrative leaders within the branch and the respective forces command (AGF, ASF, and Army Air Forces or AAF) gained their bearing, as it were.[147] Within the engineer branch, the quandary throughout the war was the appropriate degree of technical training and associated training timelines. The uber-specialization of some of the branch's more technical military occupational specialties required the Army to pursue and procure training from civilian institutions of higher learning or technical training programs to achieve the requisite ends.[148] In conjunction with this dilemma, the branch's executive stewards wrestled with the sufficient duration of individual engineer soldier

[147] Ibid, 241-69.

[148] Ibid, 244.

preparation.[149] The branch's inherent and necessary advanced aptitude requirements were omnipresent yet not always overtly acknowledged.[150]

The Army sought individuals for its exclusive engineer formations of physical inclination and mental predilection. It serves well at this point to note the salient consideration that war and military service, among its wide array of inherent elements, is the reality of elevated physical strain. For the US Army combat engineer of World War II, this was especially true of those assigned to units and duties within the SWPA. Persistent excessive temperatures in conjunction with high humidity and maladies such as malaria and dysentery made the need for these soldiers to be in the best possible physical condition even more critical. But these soldiers of the SWPA combat engineers simultaneously had to be of fortified mind. Engineer soldiers had responsibilities such as operating construction equipment or machines, producing maps, conducting land surveys, placing float bridges, and for those within combat units, determining, emplace, and executing demolition activities. As such, those achieving a higher score on the service's Army General Classification Test or AGCT and an aptitude for such skills often found themselves assigned to the engineer branch.[151]

Experience and aptitude were especially desirable in 1942 as the critical element of time drove the Army and engineer branch's training program. The imprint of this reality on the design of enlisted preparations was more pronounced in the sourcing of officers to command combat engineer units and serve as engineer specialists at the respective levels of command. With the

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[149] Carl Mann, *He's In The Engineers Now*, (New York: Robert M. McBride and Company, 1943), 17.

[150] United States Army, *Technical Manual (TM) 12-425, Personnel Classification,* (Washington, D.C.: War Department, 1944), 9.

[151] Coll, Keith, and Rosenthal, *The Corps of Engineers: Troops and Equipment,* (1958; repr., Washington, D.C.: Center of Military History, The United States Army, 2002), 246.

noted inability of the US Military Academy to provide enough lieutenants to fill the emerging need, the branch turned to the Officer Candidate School (OCS) program.[152] To attain admittance into the program, an engineer soldier must have had a minimum service time of three months, achieved no less than 110 on his AGCT, and be recommended by his commanding officer, among other requirements.[153] Of course, associated with this last requirement was the skill most challenging to quantify: his ability to lead groups of soldiers in combat. Special mention of this trait as it relates to the context of what these units would encounter in the SWPA warrants mention. Army leaders, from Second Lieutenant (2nd Lt.) platoon leaders to Generals commanding divisions, must be critical thinkers who can act independently as the situation dictates. However, as discussed throughout this project, the situational realities of the SWPA theater dictated smaller formation operations and conditions necessitating independent action even during combined operations. Therefore, platoon and company-level leaders often had to adapt to situations as they existed immediately and acted devoid of higher headquarters' direction. That was a personal character trait the Army admitted unsuitable for objective measurement when identifying officer candidates.[154]

All these training and preparatory obstacles notwithstanding, it is a remarkable achievement in and of itself that the US Army fielded formidable formations across the globe during World War II. It is worth acknowledging that of the combatant nations in World War II, no other army did or could organize, equip, and transport its units on a scale in any way equitable to that of the United States. Engineers provided at least adequate performance of their doctrinal

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[152] Mann, *He's In The Engineers Now*, (New York: Robert M. McBride and Company, 1943), 59.

[153] Ibid, 60.

[154] Coll, Keith, and Rosenthal, *The Corps of Engineers: Troops and Equipment,* (1958; repr., Washington, D.C.: Center of Military History, The United States Army, 2002), 149.

responsibilities despite these challenges and the ultimate crucible of adapting to geographic realities in the respective theaters of war. From a training perspective, individual soldier and collective unit training occurred in the separate theater of operations. Such a reality, while it appears callous about soldiers' initial forays into combat and under conditions not explicitly prepared for, this truism is often the case for all armies across history. In time, such circumstances can and often prove immeasurably beneficial. This was the case for the engineers of the SWPA and their Army brethren. Combined arms operations were critical to U.S. strategic and operational success in this theater. At least in this region, the Army's propensity for such missions resulted from work experience. As stated, the Army's arms and services of the combined arms array learned by doing.

Lieutenant General (Lt. Gen.) McNair sought to incorporate into the AGF program of training combined arms operations. Such intent was sensible, but the analyst must question how effective it was within the context of AGF's primary responsibility for individual and unit (collective) training to develop skill competency, as with the reality of soldiers developing an acceptable proficiency once employed with their assigned units in their respective theater of war, combined arms aptitude across the Army's various arms likewise predominately occurred from operational experience. The Army's new amphibious functional concept, for the obvious reason of being newly established, demonstrated operational competency advancement. Once the Army decided to take on the innovation of performing amphibious landings themselves, they had to first determine the dimensions of this activity in its most narrow sense, let alone integrating infantry and artillery arms into that operational doctrine.

Another aspect of combined arms evolution in the opening months of World War II, specifically the SWPA, is that the Army faced the arduous task of preparing its soldiers and units

to perform in every topographic and climatic setting. Realistically, this was unfeasible from a training perspective. The Army needed to gain experience, training resources, and, most critically, the time to train for every contingency fully. As with their sister arms, the combat engineers had to endure the incinerator of SWPA combat conditions to develop the effectual doctrine necessary to enable successful operations eventually.

Alexander Kiralfy in his 1942 summation as to how the US could ultimately defeat Japan, began with the argument that the Army's and Navy's respective means and methods at the tactical level were insufficient to achieve victory in 1941 and early 1942.[155] This supposition mirrors conclusions on behalf of the Army's engineer branch administrative leaders from their observations of worldwide military operations from 1939 onward, particularly of the German Army.[156] However, this shared assessment was within the broad realm of the word, not a vision statement illuminating a specific way forward. Because the implied lessons learned were associated with the well-publicized concept of "Blitzkrieg" or modern, mobile war with armored vehicles as the critical element in Europe, the question was, how could and did the US Army apply those combined arms deductions to the SWPA? An area of islands and topography is antithetical to using such technology and tactics.

Individual engineer soldier training, the concern with duration notwithstanding, was foundational to building functional combat engineer soldiers and units. In his 1943 book, Carl Mann references the Army's Engineer Handbook, which he notes, presents the blunt admonition that engineer soldiers must expect to complete their unique work while simultaneously

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[155] Alexander Kiralfy, *Victory in the Pacific: How We Must Defeat Japan*, (New York: The John Day Company, 1942), 217.

[156] Coll, Keith, and Rosenthal, *The Corps of Engineers: Troops and Equipment,* (1958; repr., Washington, D.C.: Center of Military History, The United States Army, 2002), 20.

combating enemy formations.[157] Thus, prospective engineer soldiers (and officer candidates) had to have the requisite dexterity for the technical requirements of the branch but also develop the necessary infantry skills associated with combat operations. For those destined to serve in the Southwest Pacific Area of operations, the specter of jungle combat loomed. Lieutenant Colonel (Lt. Col.) Henry Kelly, an instructor at the Army's Command and General Staff School during the World War II era, penned an article in which he cites the service's jungle warfare manual (*FM 31-20, Jungle Warfare*) relating to the inherent physical strain of such an environment.[158] The quote conveys the reality that combat engineers would encounter in the SWPA, fighting enemy formations and the arduous physical conditions of the jungle.[159] A key element of Kelly's narrative is the supposition that the Army had to train its soldiers and units to conduct operations in such an environment.[160] The question and associated concern are that if the Army already suffered discord regarding sufficient and proper training from a fundamental and military skill perspective, how could they realistically expect to incorporate specialized training such as this?

The reality of this assertion is that this tutelage would occur in the SWPA and due course of operations. Kelly correctly identifies fundamental skills, such as navigating through rugged jungle terrain, as a combat necessity.[161] He further implies the need for engineer contributions through the reduction of vegetation to facilitate combat maneuvers on the part of the infantry.[162]

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[157] Mann, *He's In The Engineers Now*, (New York: Robert M. McBride and Company, 1943), 48.

[158] Lieutenant Colonel Henry E. Kelly, "Jungle Warfare," *Military Review* XXII, no. 85 (Second Quarter 1942), 53.

[159] Ibid.

[160] Ibid.

[161] Ibid, 53-4.

[162] Ibid.

Of course, within the first year of operations in the SWPA, necessity dictated the composition of the combined arms structure and the corresponding operational planning. Gen. MacArthur, restive to invoke an active as opposed to passive defense through his headquarters staff, used the formations and associated capabilities currently at his (MacArthur's) disposal. This included engineer units and their resulting contributions as engineers and, as necessary, by performing the role of combat infantry.[163] Engineer doctrine in 1942 explicitly qualified the requirement of integrating the activities and capabilities of engineer units into a larger, combined arms operational structure "rapidly and efficiently" to perform successful operations.[164] Applying engineer capabilities in a narrow context rested on four considerations. Those considerations, according to doctrine, were time, equipment, materials, and, most critically, men.[165] Those considerations are not misaligned with or foreign to military operations in general. The simple objective for all military operations, as given in the Army's 1941 over-arching or foundational doctrine, *FM 100-5, Operations*, is to engage and destroy a shared enemy.[166]

Furthermore, Army doctrine established that the natural state of operations was combined arms.[167] With foundational principle overtly stated by the Army itself, from a historiographical perspective, it begs the question as to why analysis of the United States Army's experience in World War II has, but not universally, overlooked this element and the contributions of arms

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[163] Karl C. Dod, *United States Army in World War II: The Technical Services: The Corps of Engineers: The War Against Japan*, (1966, repr., Washington, D.C.: Center of Military History, United States Army, 1987), 182.

[164] United States Army, *Field Manual (FM) 5-5, Engineer Field Manual: Troops and Operations* (Washington, D.C.: War Department, 1941), 230.

[165] Ibid, 231.

[166] United States Army, *Field Manual (FM) 100-5, Operations* (Washington, D.C.: War Department, 1941), 22.

[167] Ibid, 5.

beyond infantry or armor most notably. Planners of the SWPA headquarters, by Army practice and process, structured their operations based on necessity or operational objective. As noted previously, during the early months of the war, a condition by available capabilities drove combined arms composition best suited to achieve Gen. MacArthur's given objectives. The Army in 1941-1942 was fighting a Pacific War that it had not fully expected or even explicitly prepared for, as the nation had long anticipated Germany to be its primary antagonist.[168] That the Army was insufficiently prepared to conduct large-scale operations across the globe while emerging from the scarcity of the Great Depression is unsurprising. Furthermore, while the strategic plan at the war's outset called for a defensive posture in the fight against Japan in the opening months of the conflict, MacArthur, while not disavowing that postulate, was determined to execute a strategic defense through limited offensives at the tactical level.[169]

While historians and authors such as John McManus, Walter Borneman, and Harry Gailey have discussed SWPA operations in several monographs associated with the Army's Pacific War record, the exposition has effectively centered upon the activities of arms and services other than logisticians, transportation, and the engineers. Again, this omission is antithetical to the Army's stated doctrine. The objective, whatever its nature may have been, *FM 100-5, Operations* states is generally, but not always, seized through combat with an enemy formation(s).[170] But, it also acknowledges that a given objective may be successfully achieved

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[168] Coll, Keith, and Rosenthal, *The Corps of Engineers: Troops and Equipment,* (1958; repr., Washington, D.C.: Center of Military History, The United States Army, 2002),

[169] Staff of General Douglas MacArthur. *Reports of General MacArthur: The Campaigns of MacArthur in the Pacific,* vol. 1. Washington, DC: Office of the Chief of Military History, Department of the Army, 1950.

[170] United States Army, *Field Manual (FM) 100-5, Operations* (Washington, D.C.: War Department, 1941), 97.

through effective battlefield maneuvering.[171] With the requisite space and time to effectively execute such maneuverability, *FM 5-5* clearly shows that battlefield maneuver was an engineer's function.[172] For the combat engineers of the SWPA and in the opening months of the war particularly, the performance of this critical need was primarily achieved with the implements of a foregone age, hand tools such as pick-axes, spades, and machetes—simple utensils for an austere battlespace.

The contexture realities acknowledged that the critical ingredient to extrapolate from the operational conditions is that combined arms design was effectively inherent to all operations. While operational fact was genuinely applicable to the U.S. Army in each of its World War II operational theaters, there was the intent with stateside training to entrench combined arms functionality, especially within the arms of the AGF.[173] The vision of AGF Commander Lt. Gen. McNair resulted in six fundamental training principles that each unit had to complete before deployment.[174] One of those six was a proficiency baseline in combined arms operations.[175] Large-scale maneuvers conducted at various training sites throughout the continental United States and under conditions intended to replicate, as closely as possible, those expected on the

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[171] Ibid.

[172] United States Army, *Field Manual (FM) 5-5, Engineer Field Manual: Troops and Operations* (Washington, D.C.: War Department, 1941), 1.

[173] Robert R. Palmer, "Organization and Training of New Ground Combat Elements," in *United States Army in World War II: The Army Ground Forces: The Organization of Ground Combat Troops*, ed. Kent Roberts Greenfield, Robert R. Palmer, and Bell I. Wiley (1947, repr., Washington, D.C.: Center of Military History, United States Army), 391.

[174] Headquarters, Army Ground Forces, Office of the Commanding General. *Report of Activities, Army Ground Forces, World War II*, (Washington, D.C.: U.S. Government Printing Office, 1946), 18.

[175] Ibid.

battlefield served as the capstone training validation. While admirable in intent, this program of instruction and preparation did present its challenges, as Coll, Keith, and Rosenthal noted.

The primary obstacle is a product of the AGF's prioritization of developing the divisional team at the expense of non-divisional units. Due to its divisional affiliation, the organic engineer battalion of the triangular infantry division received considerable combined arms attention. In contrast, persistently underserved by AGF cadre and training centers were the non-divisional engineer battalions, according to the Chief of Engineers. [176] While accurate in assessment, the researcher must note again that for the Army to meet its operational needs within the theater commanders' periods, instituting a robust and in-depth training program evenly across the service was impractical. The practical solution was what occurred. H.E. Fooks notes that MacArthur, with his SWPA strategic outline in place, established training sites in Australia to prepare soldiers and units for the relative conditions of the SWPA, such as jungle warfare and amphibious operations.[177]

As Kevin Holzimmer notes, the Army's planners in the pre-war period believed the nature of jungle combat was restrictive to combined arms functional design.[178] That is a proper consideration, especially in comparison to the operational environment of North Africa and Western Europe. But such a deduction reduces the combined arms concept to an oversimplified

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[176] Coll, Keith, and Rosenthal, *The Corps of Engineers: Troops and Equipment,* (1958; repr., Washington, D.C.: Center of Military History, The United States Army, 2002), 353.

[177] Lieutenant Colonel H.E. Fooks, "The War in the Pacific, 1943-44: Guadalcanal to Leyte Gulf," *Journal of the Royal United Service Institution* 95, (February 1, 1950), 448-59.

[178] Kevin C. Holzimmer, "In Close Country: World War II American Armor Tactics in the Jungles of the Southwest Pacific," *Armor* 106, no. 4 (Jul/Aug 1997): 21.

envision of large-scale armored and vehicular formations on continents consisting of open and flat terrain. Army and engineer doctrine made no such definitive delineation.

Professionals within the US Army and all armies have long understood that proper supply and maintenance in a respective operational area or region are essential to success on the battlefield. Therefore, the engineers of the SWPA were responsible for enabling combat maneuverability in this restricted terrain and establishing conditions sufficient for the supporting or service units to sustain the combat arms. The Army's *Field Manual 31-20, Jungle Warfare* (1941), exemplifies the heightened importance of the environmental context.[179] Planners, therefore, on the SWPA always had to account for this reality in their functional design and task force structure. As noted by Holzimmer and reinforced throughout *FM 31-20*, the persistent concern with establishing conditions for movement and maneuver had a fundamental and inherent essential role for the Army's engineers, both combat and service (or construction) units. Trudeau echoes this supposition and obliquely offers a facet of operational development that SWPA planners and commanders must be cognizant of. That is the relative nature of doctrine. Army doctrine, in this context, is more art than science. He concludes that doctrine in general, but especially with jungle warfare, cannot be dogmatically adhered to and applied.[180] There is no substitute, therefore, for "imagination and ingenuity, assuming equally good judgment is applied in both cases."[181]

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[179] United States Army, *Field Manual (FM) 31-20, Jungle Warfare,* (Washington, D.C.: War Department, 1941), 1-2.

[180] Trudeau, "Mobility and Motors," *Military Review* XXII, no. 84 (April 1942), 26.

[181] Ibid.

While not a critical research element associated with this dissertation, it warrants I mention that the US Army's soldiers were unfamiliar with these climatic nuances and the impact upon the physical state of each individual and a unit's collective functionality. As enunciated in *FM 31-20*, physical exertion in this high heat, highly humid environment, without proper precautions, could defeat the Army as if they had emerged from combat with the Japanese.[182] This represented a command consideration for engineer and non-commissioned officers greater in magnitude than their infantry or artillery brethren. The engineers, although not universally, when not executing combat operations, often had to conduct the more technical applications of the branch, such as building or improving fighting positions, lines of communication, road and trail improvements, or small life sustainment projects.[183]

Army jungle warfare doctrine explicitly stated that "engineers should be attached to every jungle expedition."[184] Reconnaissance is an inherent and critical element of all combat operations and was especially essential in the austere jungle environment of the SWPA. It is a means by which commanders and operational planners receive intelligence and process it into information that aids in operational plans.[185] Across the Army's doctrinal publications of the period, this tenet is constant and consistent. Specifically, as cited in Jungle *Warfare* and the essential *Engineer Manual FM 5-5, Engineer Field Manual: Troops and Operations* (1941), the combat engineer reconnaissance, while tangibly technical for the engineer, is likewise tactical for

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[182] United States Army, *FM 31-20, Jungle Warfare,* (Washington, D.C.: War Department, 1941), 3.

[183] Dod, *United States Army in World War II: The Technical Services: The Corps of Engineers: The War Against Japan*, (1966, repr., Washington, D.C.: Center of Military History, United States Army, 1987), 195.

[184] United States Army, *FM 31-20, Jungle Warfare,* (Washington, D.C.: War Department, 1941), 22.

[185] United States Army, *Field Manual (FM) 100-5, Operations* (Washington, D.C.: War Department, 1941), 40-47.

the planner or commander.[186] The intelligence of concern to the engineer that becomes essential to the combined arms commander is associated with geographical features and characteristics, water or other gap crossings, existing bridges, and other intelligence that may be used to develop information to plan for the implementation of the combined arms force.

But while all the department and theater-level planning appeared sufficient within the realm of theory, the reality presented a much more complex and problematic proposition as it existed on the various battlefields. Beginning with the opening weeks and months of combat in the Philippines, this period represents, at least within the Pacific, the Army's early foray with combined arms operations. As stated, the combat engineers' focus on the island of Luzon and later Corregidor was to inhibit Japanese mobility while simultaneously erecting US and Filipino defensive works and correlating obstacles.[187] The strategic and tactical realities of the situation required MacArthur to execute the planned withdrawal into the Bataan peninsula by the War Department's pre-conflict War Plan Orange (3).[188] Noted, this defensive operation's success, to any degree, as Louis Morton surmised, rested with the engineers.[189] The exigency of the situation in December of 1941 and subsequent months until the US and Filipino capitulation the following May offered no time or space for deliberate doctrinal progression. That December found the US

[186] United States Army, *Field Manual (FM) 5-5, Engineer Field Manual: Troops and Operations* (Washington, D.C.: War Department, 1941), 1.

[187] Louis Morton, *United States Army in World War II: The War in the Pacific: The Fall of the Philippines* (1953, repr., Washington, D.C.: Center of Military History, United States Army, 1993), 164.

[188] Morton, *United States Army in World War II: The War in the Pacific: Strategy and Command: The First Two Years*, (1962; repr., Washington, D.C.: Center of Military History, United States Army, 2000), 24-44.

[189] Morton, *United States Army in World War II: The War in the Pacific: The Fall of the Philippines* (1953, repr., Washington, D.C.: Center of Military History, United States Army, 1993), 168.

and Filipinos with one combat engineer battalion comprised of US Army officers and Philippine Scouts within the enlisted ranks.[190]

Cognizant of the strategic situation, these engineers had initiated defensive preparations, but Japan's invasion ended that and forced the Americans and Filipinos to fight with what they had.[191] As the Japanese *14th Army* fought its way south with superior mobility and air support, the Americans, and Filipinos, devoid of logistical support and personnel reinforcement, among other operational disadvantages, performed admirably and destroyed the Japanese operational timeline for conquering the archipelago. It is specious to characterize this period as a consummate example of combined arms, as every American soldier and Philippine Scout eventually became an infantryman regardless of their occupational specialty. However, it does warrant mention of embryonic contributions to this operational concept.

Gen. MacArthur's initial punch at the perceived Japanese juggernaut and the initial attempts at a deliberate combined arms design came in New Guinea. Japanese strategic intentions at this time likewise viewed this large island as critical to securing the southern flank or approaches to their primary South Pacific base at Rabaul, on the island of New Britain.[192] The race to seize New Guinea again resulted in urgency being the overriding factor in the composition of the US and Australian task forces. To support MacArthur's intended active defense on the island, US Army engineers, by the summer of 1942, were constructing operational

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[190] Dod, *United States Army in World War II: The Technical Services: The Corps of Engineers: The War Against Japan*, (1966, repr., Washington, D.C.: Center of Military History, United States Army, 1987), 68.

[191] Ibid, 67.

[192] Staff of General Douglas MacArthur. *Reports of General MacArthur: Japanese Operations in the Southwest Pacific Area,* vol. II, part I, (1950, repr., Washington, DC: Office of the Chief of Military History, Department of the Army, 1994), 126.

bases and airfields. That this effort was the primary American operational focus at this time meant that when the Imperial Japanese Army put their formations ashore in late August of 1942 in the Milne Bay area, these engineers, alongside anti-aircraft gunners, became the first American combat units in the SWPA.[193]

As the New Guinea bludgeoning continued, the necessity and opportunity to attempt various forms of combined arms operational structure helped refine the concept. This context also allowed the combat engineers to refine existing doctrinal responsibilities and assume new roles pivotal in subsequent operations. The Buna campaign (Japanese base of operations on the northern New Guinea coast) represented the initial SWPA offensive for MacArthur's formations, primarily from the US 32nd Infantry Division and Australian units. The area surrounding and throughout the Buna region consisted of jungle undergrowth and swamps. Water gaps or crossings dotted the room, all of which lent themselves to escalated contributions from combat engineers. Added to this were the numerous and elaborate defensive fighting positions constructed by the Japanese that required US Army engineer demolition operations.[194]

The New Guinea campaigns of 1942-3 are noteworthy not only for being the first Allies' initial victory over Japan on land (Buna, Papua) but for introducing two elements that became tenets of combined arms operations within the SWPA.[195] Aerial support included a "new" concept of transporting combat troops from a base of operations to a combat area and the

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[193] Dod, *United States Army in World War II: The Technical Services: The Corps of Engineers: The War Against Japan*, (1966, repr., Washington, D.C.: Center of Military History, United States Army, 1987), 175.

[194] Walter R. Borneman, *MacArthur At War: World War II in the Pacific*, (New York: Little, Brown and Company, 2016), 243.

[195] General Robert L. Eichelberger and Milton MacKaye, *Our Jungle Road to Tokyo*, (1950, repr., Auckland, New Zealand: 2015), in his first-person account of the war and the Buna campaign specifically, GEN Eichelberger notes that this offensive successfully culminated prior to Guadalcanal in the Solomons.

circumvention of Japanese strongpoints via amphibious assaults (or "leapfrogging").[196] As MacArthur's principal American ground commander at Buna Lt. Gen. Robert Eichelberger annunciated, these operational concepts and resultant lessons accumulated would be applied to subsequent operations, not only as it is associated with means, but to preserve the lives of US soldiers, sailors, and airmen.[197]

The eventual successes of these operational components and, therefore, victories historians and researchers may surmise resulted in elevating this command area in strategic importance and the support directed towards MacArthur and the SWPA. The contention between the single axis of advance towards Japan versus two, while a persistent scourge below the surface, would become an enraging inferno had operations in New Guinea been unsuccessful. MacArthur himself harbored such a fear throughout 1942 and on the heels of Japan's seizure of the Philippines.[198] In such a scenario, that conclusion on the researcher's part is academic, as Allied failure implies Japanese success and control of New Guinea. Japanese control of New Guinea would have confined to Australia MacArthur and the remnants of his command. The historian may then assume that MacArthur would have likewise been without US Navy support, depending upon the outcome on the island of Guadalcanal.

The seeds planted in New Guinea blossomed into a level of combined arms proficiency from Nassau Bay to the Philippines such that Brig. Gen. William Heavey of the amphibious

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[196] Brigadier General William F. Heavey, *Down Ramp! The Story of the Army Amphibian Engineers*, (Washington, D.C.: 1947), 51.

[197] Borneman, *MacArthur At War: World War II in the Pacific*, (New York: Little, Brown and Company, 2016), 257.

[198] Staff of General Douglas MacArthur. *Reports of General MacArthur: The Campaigns of MacArthur in the Pacific,* vol. I, (1950, repr., Washington, DC: Office of the Chief of Military History, Department of the Army, 1994), 72.

engineers proclaimed that future military professionals and historians would study these campaigns alike "as a classic military operation."[199] Combat engineers contributed in various ways, rarely addressed outside the Army's official technical publications (i.e., engineer volumes of the *US Army in World War II* series or "Green Books"). For instance, one of the combat engineers' taskings as part of the New Guinea campaign was to demolish or destroy seized Japanese bunkers and erect or re-build previously destroyed bridges.[200] Other notable combat engineer actions demonstrating their critical ingredient in the combined arms formula were countless examples of their building or repairing bridges over impassible rivers or streams while receiving Japanese fire so that American infantry and armor could sustain their attacks.[201] Similar to the earlier action in Milne Bay, in early 1943, the first unit of the US Army's 41st Infantry Division to experience combat was the 1st Platoon, Company B, 116th Engineer Combat Battalion.[202] Combat engineers continued to display, intentional or not, a propensity for being the tip of the spear.

Examination of the Army's war record throughout the SWPA and through the context of combined arms operations concludes with the summation that the engineers, specifically combat engineers, were multi-faceted. Such articulation requires little analysis in its arrangement for this branch that Army leadership has traditionally viewed as the service's multipurpose battlefield implement. Throughout MacArthur's SWPA operations beginning with New Guinea and

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[199] Brigadier General William F. Heavey, *Down Ramp! The Story of the Army Amphibious Engineers*, (Washington, D.C.: Infantry Journal Press, 1947), 68.

[200] Dod, *United States Army in World War II: The Technical Services: The Corps of Engineers: The War Against Japan*, (1966, repr., Washington, D.C.: Center of Military History, United States Army, 1987), 200.

[201] Ibid, 200-1.

[202] Ibid, 205.

subsequent operations on New Britain, Wakde, Biak, and Noemfoor, culminating with the return to the Philippines, combat engineers provided a wide array of direct and indirect support to the infantry. The nature of this support sometimes consisted of activities that the engineer soldiers themselves, state-side trainers, or branch administrators did not, and could not, fathom before December 1941. For example, on Wakde-Sarmi island in June of 1944, as MacArthur was progressing toward the Philippine Archipelago, engineers of the 6th Engineer Battalion (Combat) of the 6th Infantry Division were tasked with clearing out Japanese soldiers from caves and crevices from which they were impeding the maneuvering of elements of the division's TORNADO task force.[203] They attempted to accomplish this by utilizing demolitions or explosives and flame throwers.[204] Incidentally, the combat engineers of the 6th Battalion, alongside the 1st Infantry Regiment (also of the 6th Division), were the first US Army units ashore in the Wakde-Sarmi operation.[205]

Both in its execution and the historiography produced during the approximate eight decades since its cessation, the Pacific War has represented a unique entry into American military and naval history. Yes, as previously postulated, all combat operations and campaigns are, to relative degrees, a form of combined arms warfare. But the Pacific War, and operations within the SWPA especially, the concept of combined arms assumed a significant role, but an element of prominence. Following the problematic Buna campaign, MacArthur surmised that the Army would have to develop refined or altogether "new weapons…for maximum application and new

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[203] Robert Ross Smith, *United States Army in World War II: The War in the Pacific: The Approach to the Philippines*, (1953, repr., Washington, D.C.: Center of Military History, United States Army, 2005), 268.

[204] Ibid.

[205] Ibid, 260.

and imaginative methods."[206] In this war and in this time and place, it would not do for the US Army to have its soldiers deposited on land. This maritime theater meant every operation initiated with an amphibious assault, often on beaches under the watch and munitions of the Japanese enemy. And while these islands, New Guinea and the Philippines excluded, were diminutive in size, their often-dense jungle and absence of modern infrastructure only raised the profile of the combat engineers as part of the combined arms team.

Whether AGF Commander Lt. Gen. McNair had the foresight, the transition of the US Army's infantry divisions from the more significant and unwieldy square structure to the triangular organization was well suited for SWPA operations. Smaller, lighter, and tailorable were characteristics required to compile combined arms or task forces in this theater of the war. The organic engineer divisional formation, like the division, constricted from a regiment exceeding eight hundred officers and enlisted soldiers to a battalion just north of five hundred.[207] But there was no corresponding doctrinal alteration. The combat engineer mission remained as pronounced in *Field Manual 5-5*, *Engineer Field Manual: Troops and Operations* (1941). That is the Army engineers' foundational mission of escalating the combat power and, therefore, the effectiveness of its other branches. Inherent to this responsibility are three means by which the engineers were to achieve this. First, by enabling the movement of US Army formations in the battlespace. Second, by conversely denying or impeding freedom of movement (and maneuver)

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[206] Staff of General Douglas MacArthur. *Reports of General MacArthur: The Campaigns of MacArthur in the Pacific,* vol. I, (1950, repr., Washington, DC: Office of the Chief of Military History, Department of the Army, 1994), 100.

[207] Coll, Keith, and Rosenthal, *The Corps of Engineers: Troops and Equipment,* (1958; repr., Washington, D.C.: Center of Military History, The United States Army, 2002), 12.

to the enemy. Third, the planning and construction of US Army soldier's shelter and comfort.[208] This mission and its inherent elements would not change throughout the war. As doctrine evolved, it did so in response to specific operational necessities emanating from situational realities. But philosophy, regardless of the time and place of application, its intended and requisite end state remained consistent with these three elements.

Therefore, as historians dissect the combined arms organizational elements of the Army's operational design in the SWPA, a visualization emerges of the engineer purpose (mission) regardless of task force composition variances. The engineers accomplished these missions and other isolated tasks relative to the situational context of the SWPA that differed from the experiences of their fellow Army engineers in the different operational theaters of World War II. As Brig. Gen. Jens A. Doe noted in 1944, combat operations in the Southwest Pacific jungles were smaller. They, therefore, required scaled-back formations and engaged in close infantry combat. [209] Additionally, foliage obscured the battlefields, and the terrain was often rugged and precluded the ability to execute decisive flanking movements of Japanese emplacements or fighting positions. The Japanese soldier, whatever technological or tactical limitations he may have had, fighting a tenacious defense was not such an impediment. A determined, well-entrenched, or emplaced enemy decently armed is a formidable challenge. This war did not characterize mobility in the modern sense of the military parlance; it was a bloody slugging match requiring engineer capabilities to enable movement often where no such opportunity

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[208] United States Army, *Field Manual (FM) 5-5, Engineer Field Manual: Troops and Operations* (Washington, D.C.: War Department, 1941), 1.

[209] Brigadier General Jens A. Doe, "Notes on Jungle Warfare," *Military Review* XXIII, no. 10 (January 1944): 5-9. Note: BG Jens served with the U.S. 41st Infantry Division in the SWPA and his analysis is based on firsthand experiences.

previously existed. And to do so under fire and often while simultaneously fighting as infantrymen.

Lt. Col. Arthur G. Trudeau amplifies the role of engineers as part of the combined arms team by extolling their inherent responsibility (primary) for maintaining and restoring mobility to the combined arms force.[210] As needed, they also perform the combat role of infantry, albeit minus indirect fire support weapons.[211] He surmises that topographical and climatic realities in a given time and place render modern technological mobility useless.[212] Again, he argues that maneuverability or tactical mobility is relative by postulating that natural and artificial obstacles can stymie or halt armored vehicles altogether.[213] A reality of the SWPA. He summarizes this nicely: "If the war has taught us only one lesson, it should be that blind adherence to doctrine and convention must fall before imagination and ingenuity, assuming equally good judgment is applied in both cases." [214]

Combined arms and the combat engineers' portion of this framework relied upon branch structure, training, doctrine, and tools. As the war progressed, it also benefited from battlefield experience. However, there is another component to this functional design and execution that is the most essential, the human element and, more specifically, that of leadership. All the tools and means accessible to soldiers on the battlefield are for naught without effective direction and purpose.

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[210] Lieutenant Colonel (LTC) Arthur G. Trudeau, "Mobility and Motors," *Military Review* XXII, no. 84 (First Quarter 1942), 26.

[211] Ibid.

[212] Ibid.

[213] Ibid.

[214] Ibid.

Chapter IV:

Leadership

Tactical proficiency is only one element of effective and successful military leadership. It is a multifaceted and deliberate process aimed at influencing others (subordinates) to accomplish a specific mission. Acknowledging the inherent complexity of military operations, proper alignment establishes the foundation for success across the multiple elements of an organization or combined arms task force. Leadership is the connective tissue ensuring adequate synchronization. Presenting leadership as the most critical element of tactical proficiency and the broader operational process is a fair supposition. Demonstrated leadership throughout the Army's engineer branch contributed to tactical and strategic successes in the SWPA between 1942 and 45.

Before analyzing military leadership through the prism of SWPA combat engineers specifically and the engineer branch overall, we must conduct a brief exegesis of it in a general sense. The bottom line for military leadership is mission accomplishment through motivating others.[215] The United States Military Academy or West Point implied tactical or professional proficiency, but this attribute was not explicitly a prerequisite for leadership.[216] The West Point leadership textbook published in 1960 provides an overview of the role consisting of characteristics and responsibilities that are timeless in the application and appropriate for this disquisition. Whereas tactical aptitude, both in planning and execution, is vital for those who lead soldiers, interpersonal and relational skills are most prominent. Soldiers will determine the success of tactics; the leader must prepare their soldiers appropriately. Leadership, specifically in

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[215] Department of Tactics, Office of Military Psychology and Leadership, United States Military Academy, *Military Leadership*, (West Point, NY: United States Military Academy, 1960), v.

[216] Ibid, 2.

this instance within the US Army's World War II experience, demonstrated the fallacy of the leaders are born or "great man" inference that has permeated military historiography and leadership philosophy.[217]

The US Army has demonstrated its belief that leadership development is a deliberate process and a product of natural selection. The most notable example of this supposition is the existence of West Point. This philosophy also allows for the amalgamation of character values, i.e., morality, into leadership attributes. Integrity, effective communication (across all means), critical thinking, initiative, being physically active, and a sense of accountability or responsibility represented what the Army of World War II sought to develop in their leaders.

Avoiding the predicament of over-generalization, with prospective engineer officers during World War II and through the present day, a need for elevated technical propensity exists. This technological proclivity differs from tactical prowess in the narrow military sense; therefore, the supposition that tactical skill and knowledge occupy a place of lower prerequisite priority remains valid. But as briefly examined in the previous chapter, the Army's engineer branch had a leadership void at the war's outset. This cavity was not exclusive to the company (platoon leaders and company commanders) level but afflicted the branch at every leadership position and rank.

While West Point provided the preponderance of Second Lieutenants into the Regular Army on an annual basis and thus represented most engineer officers as of 1941, other means were necessary to meet the requirement from 1942 forward. Reserve Officer Training Corps (ROTC) and OCS represented the methods to fill the induction gap and overtook West Point as the branch's primary commissioning source in time. Illustrating this quantitative reality was the

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[217] Ibid, 8-9.

branch's officer estimate required to fill projected unit leader positions for 1942. The department forecasted a need for 6,736 officers that year, but only 6,187 were available.[218] Of the 549 deficiencies, according to Coll, Keith, and Rosenthal, the majority were with the senior ranks or leaders.[219] A leadership absence will have detrimental impacts regardless of the level(s) where the omission exists. Within this context, the lack of senior grade officers at the battalion, brigade, and divisional levels was especially critical as these levels establish the overarching vision (desired goal or end state) that guides subordinate company-level leaders. Tactical execution and success may be "bottom-up" once on the battlefield, but leaders at the tactical level are a rudderless vessel without "top-down" direction, mentorship, and quality assurance.

Contending with this shortage appears simple enough where it is a matter of filling positions in a static context. The reality was that these officer positions correlated with the engineer's expanded operational responsibilities and new units associated with their current scope of activities.[220] Further complicating the leader or officer ascension process was the unit leaders' role in the collective training and preparation for their formations. While the engineers' successful wartime expansion and development program was a notable achievement, many combat engineer soldiers and their leaders had to prepare while deployed to their respective theaters of operations. It is an unenviable reality for soldiers, officers, and combat commanders who rely on engineer capabilities to enable their operations. In this scenario, initiative, judgment,

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[218] Blanche D. Coll, Jean E. Keith, and Herbert H. Rosenthal, *United States Army in World War II: The Technical Services: The Corps of Engineers: Troops and Equipment*, (1958; repr., Washington, D.C.: Center of Military History, United States Army, 2002), 122.

[219] Ibid.

[220] Ibid, 123.

endurance (mental and physical), and relational leadership characteristics were most critical to collaborative development.

Within the SWPA specifically, engineer leaders had to contend with significant infrastructure construction needs while simultaneously conducting combat operations, primarily as infantry, but in at least one instance as artillery.[221] The lack of contemporaneous infrastructure to support Army operations in a modern sense created a leadership challenge unique to the engineers. The Army needed to adequately plan for this reality by expediting the SWPA in disproportionate numbers, combat units, and equipment despite the inability to support them logistically and from a base operations perspective appropriately. In this scenario, the need for initiative and critical thinking on the part of engineer leaders, especially at the unit level, was indispensable.

The historian and researcher should recognize that the scope of combat engineer leaders in the SWPA was not just that of commander. First, we must establish a clear demarcation between the terms of leader and commander. These are not interchangeable synonyms but, in military parlance, typical collocations. West Point has traditionally characterized a leader as more abstract and not constrained by position. It is a matter of influence.[222] We find leaders throughout an organization or unit and with Army officers, which includes occupying a staff position just as much as a command billet. Providing inspiration and direction to others, in simple terms, illustrates effective leadership.

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[221] Ibid.

[222] Department of Tactics, Office of Military Psychology and Leadership, United States Military Academy, *Military Leadership*, (West Point, NY: United States Military Academy, 1960), 4.

Conversely, command correlates to position in a unit. As the West Point leadership curriculum has historically noted, not all commanders are leaders.[223] The student of this war may conceptualize this reality as it persisted throughout the Army's SWPA experience and the engineers, specifically during the war against Japan.

Accurate prognostication of who eventually would succeed as a leader during the engineer's rapid expansion of 1942 was subjective and difficult enough without the context of combat. How an officer or non-commissioned officer in an authoritative position conducts themselves when in contact with enemy soldiers, under difficult climatic conditions, and wanting adequate supplies cannot be definitively known until it occurs. Brig. Gen. Dwight Johns, an Army engineer officer with service in the SWPA during 1942 and later commandant of the Army's Engineer School, noted that in the early months of the war (1942), adaptive thinking and initiative were necessary leadership skills required to complete various engineer missions.[224] Austere is the most direct and encompassing adjective that characterizes the engineer's situation as World War II descended upon the United States. It did not apply to the physical reality the combat engineers found themselves in, but likewise in terms of equipment and tools specific to the branch's mission. Correlating Brig. Gen. Johns' recounting of the challenges associated with engineer missions in the opening months and years of SWPA operations, leadership is the implied common thread that offered purpose, motivation, and direction to tasks within the parameters of reality. Brig. Gen. Johns also imparted another unique means by which the Army and branch sought to help alleviate the leadership shortage.

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[223] Ibid.

[224] Dwight F. Johns, "We Are Doing What We Can With What We Have," *Military Review* XXV, no. 1 (April 1945), 10-16.

As the war between the United States and Japan became a reality, American civilian engineers employed by private firms overseeing projects throughout the Pacific Rim found themselves effectively stranded without a pathway home. The Army, having immediate operational infrastructure requirements to support combined and joint operations, sought to utilize native labor with available materials to rectify the glaring need. Without enough technologically savvy officers to lead these local civilian "conscripts" and projects, the Army gambled by commissioning a number of these civilian engineers.[225] Not a long-term procurement program to be sure, especially when considering the combat elements of the engineer combined arms role, it did provide much-needed technical (construction) leadership at the infantile stage of the war and displayed on the part of the service and branch's senior leadership a willingness to take calculated risks and abstract operational thinking in resolving an identified need. Interestingly, Brig. Gen. Johns utilized as the title for his article, "We are doing what we can with what we have," a quote he attributes to Gen. MacArthur from the period in question. That citation adequately summarizes the attitude displayed by the Army's SWPA engineer leaders in 1942.[226]

The need for a combined arms structure in the SWPA held a correlating requisite for the engineers' unique and specific capabilities. A higher headquarters typically did not assign command of these task forces to an engineer officer, but there were instances where this occurred. Combat arms officers from the infantry branch often received these assignments as the combat arm was the decisive task force component. For the engineers and their leadership, it required them to be collaborators. Major General (Maj. Gen.) Charles Corlett first commanded

[225] Ibid, 11.

[226] Ibid, 10.

the US Army's 7th Division (infantry) in the SWPA and then the US XIX Corps as part of the Normandy invasion and drive across France; he asserted that the most influential leaders were team players and excellent listeners.[227] For the engineer officer, as part of a SWPA task force, this is critical to understand the commander's intent. Comprehension was indispensable as the element that, in lay terms, was responsible for clearing the way and protecting the men and combat power of the task force. This command and support relationship was (and remains) inverse, and the prudent task force commander actively solicited and considered the task force engineer's recommendations. US Army wartime operations doctrine emphasized the need for combat commanders to preserve operational maneuverability to impose their will upon the enemy and accomplish the mission.[228]

The engineer officer commanding the engineer component (unit) of a respective task force occupied two roles—one, the apparent command position, responsible for leading the performance of assigned engineer and combat missions. The second was that of a staff officer as a task force commander's staff member. In the latter capacity, the engineer officer, or at least the effective officer, provided technical advice to the task force commander and technical contributions to staff planning and orders. In this sense, the engineer officer exemplifies Brig. Gen. Corlett's supposition that the decorous officer loyally serves the commander while simultaneously superintending his engineer soldiers.[229]

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[227] Charles H. Corlett, "Leadership," *Military Review* XXV, no. 4 (July 1945), 6.

[228] United States Army, *FM 100-5, Field Service Regulations: Operations,* (Washington, D.C.: War Department, 1941), 22.

[229] Corlett, "Leadership," *Military Review* XXV, no. 4 (July 1945), 7.

Karl Dod concludes in the drive across New Guinea that the engineers' role within the combined arms team was ill-defined.[230] No "blueprint," he argued.[231] The combat arms commanding a given task force, having a working understanding of engineer capabilities, relied upon the senior engineer officer to structure his engineer troops to meet the former's mission intent sufficiently. This, of course, afforded the engineers great latitude in planning and execution but also imparted great responsibility upon each officer or leader. An inherent element of leadership, regardless of position. This cauldron, scorching for the Army's engineer soldiers and leaders as it could be during the initial period of the war, their performance by 1944-45 demonstrated the earlier experiences to have been beneficial.

Applying leadership at the respective levels of responsibility has always been a balancing act for those charged with those roles. Army doctrine by the World War II period postulated that munitions and technological advancements had decentralized the command-and-control element of combat operations.[232] William Stofft, in his operational leadership exegesis, argues that leaders at the lowest level of leadership who fight the battle must be comfortable with this situation and confident in their ability to perform the critical operational element of leadership.[233] Throughout the combat engineers' SWPA operational records are vignettes demonstrating this. The inherent broad and flexible capabilities of the combat engineer soldiers and units provided to the higher combat (non-engineer) commanders necessitated a corresponding broad technical and leadership skill set from the respective combat engineer leaders.

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[230] Karl C. Dod, *United States Army in World War II: The Technical Services: The Corps of Engineers: The War Against Japan*, (1966, repr., Washington, D.C.: Center of Military History, United States Army, 1987), 521.

[231] Ibid.

[232] William Stofft, "Leadership at the Operational Level of War," in *On Operational Art*, ed. Clayton R. Newell and Michael D. Krause (Washington, D.C.: Center of Military History, United States Army, 1994), 192.

[233] Ibid, 193.

The intellectual and moral fortitude required of the combat engineer leader during World War II was necessary considering the Army's organic and task force composition doctrine. Per the discussion in Chapter 2 of this project, the Army's principal tactical or combat formation was the infantry division. It was, therefore, principally comprised of succeeding levels of infantry units, and completing the divisional composition were its combat and service support formations, including a combat engineer battalion (in the "new" triangle division while those divisions retaining the more traditional square structure had an engineer regiment).[234] As engineer "advisor" and commander, the divisional engineer-battalion commander had to have relative gravitas in establishing realistic expectations for the divisional commander and the divisional staff. Skilled and possessing unique combat and support capabilities, the engineers were incapable of impractical operational desires. An example is the Sixth Army's Engineer, Brig. Gen. Samuel D. Sturgis' argument against redirecting engineer bridging support away from the main effort in advance to Manilla to another supporting unit.[235] The crux of Sturgis' argument is that the latter was an isolated, momentary matter, and such a reallocation may jeopardize the ultimate objective.

Another contextual element of the SWPA associated with leadership responsibility at the tactical level was the speed of operations, a product of pre-execution planning and in response to alterations to operational conditions. The operational record of the US return to the Philippines in 1944 illustrates this reality: the increased bridging requirement for maneuverability of the infantry and armored formations. Bridging became an operational concern of foremost

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[234] In Chapter Two of this dissertation, pages 4-6.

[235] Dod, *United States Army in World War II: The Technical Services: The Corps of Engineers: The War Against Japan*, (1966, repr., Washington, D.C.: Center of Military History, United States Army, 1987), 612-13.

importance during the Philippines' operations with the prevalence of rivers and streams throughout the archipelago. This capability, however, was a finite resource in the SWPA. Commanders and planners then required prioritization at the upper echelons, such as corps and army. Commanders at the tactical level, primarily that of battalions and companies, had to be decisive and agile with emplacement plans and operations, considering each gap was unique in size and other essential characteristics. These engineer leaders had to work with and alongside combat leaders with whom they had no prior relationships. They did not prepare or train with these units before execution.

Yet there was a baseline for a performance they had to accomplish. In this sense, the combat engineer unit leader, or staff officer, was no different from every other leader in the Army. This includes leaders within the more publicized combat formations. The engineer leader or commander at the tactical level had to prepare their soldiers first as individuals and then collectively as a unit before the invasion for this to be successful. This presented a ubiquitous quandary for the engineers and the US Army. Senior organizational leadership expects and demands their tactical leaders and commanders to collectively be the primary trainers for the individual and their formations or units. Yet the historical record of the engineer branch and Army overall was that these leaders, insufficient in numbers at the war's outset, quickly identified and produced, themselves lacked tactical experience.[236] Leaders and soldiers of the SWPA's combat engineers learned through shared combat and operational experiences. A palatable notion provided the incidents were not catastrophic.

[236] Stofft, "Leadership at the Operational Level of War," in *On Operational Art*, ed. Clayton R. Newell and Michael D. Krause (Washington, D.C.: Center of Military History, United States Army, 1994), 192.

The extensive examination of combat engineer leadership in SWPA and World War II in a broader sense leads to the supposition of training's foremost status. If one visualizes this training as a map point and the ancillary leadership elements as independent thoroughfares, they all converge at training. Whether practitioners or historians have classified it as education or preparation, it was training. Historiography must expand the lens through which it has examined this element. Within historians' analysis of the Army's World War II record, training by default has equated with initial basic training and military occupational specialty apprenticeship stateside. History has and continues to overlook that activity continued in the respective combat theaters. This was true of combat engineer leaders as it was for their units' soldiers, individually and collectively. A critical aspect of military leadership is ongoing professional development. In the SWPA, each leader achieved this through experience and individual pursuit.

Within each operational area, leaders at each level needed to train their formations for operations relative to the situational realities of that theater. It also was the time to collectively prepare the units comprising a combat arms team or task force. Operational tempo often constricted the opportunity to perform such preparations sufficiently. Leaders, however, had to take advantage of that finite resource. If tactical success is the output of operations, then pre-execution preparation represents the input. In this sense, the analyst may compare military operations to a football team. There must be some training and rehearsal beforehand. This represents an element of military history neglected on the part of researchers. If leadership is the engine that drives military operations and training, the latter never genuinely complete and critical leadership responsibility, then it warrants greater emphasis.

Leadership was a compulsion behind any initiation of combat engineer doctrinal development throughout the war. Implementing and applying emerging practices by combat

engineer soldiers and units during operations required leadership. The SWPA represented a context of contrasting actualities for the US Army's engineers. First, the often-discussed fact that this part of the world in 1942-45 was one of, if not the most, underdeveloped regions.[237] From a modern infrastructure standpoint. As Coll, Keith, and Rosenthal note, this fact resulted in Army and theater leadership elevating in importance engineers' construction capability and eternal demand by tactical commanders.[238] However, the logistical realities of supplying a world war and transporting the implements required (quantity) to rectify this infrastructure quandary to the remote SWPA were constraints.[239]

Retained were the more traditional rudimentary hand tools of previous generations of the Army's engineers, and in the SWPA, their utilization expanded. This represented a unique training and tactical challenge for engineer leadership at the lowest levels. During their initial occupational skill training at Fort Belvoir or Fort Leonard Wood, these soldiers and their future chiefs received instruction with contemporaneous engineer tools of the trade. In this case, the extent of doctrinal advancement and any correlation to engineer leadership is opaque at best. Engineers in the field reciprocated lessons acquired from the SWPA experiences with the branch's administrative heads and doctrinal formulators in Washington, D.C., and the respective training centers. The empirical record indicates that the preponderance of any doctrinal evolution was with the construction practices, which were more a product of technological advancement

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[237] Dr. Gilbert Grosvenor, "New Guinea No Island Paradise to Yanks Fighting in Nightmarish Wilds," *Washington, D.C. Sunday Star*, July 9, 1944.

[238]. Coll, Keith, and. Rosenthal, *United States Army in World War II: The Technical Services: The Corps of Engineers: Troops and Equipment*, (1958; repr., Washington, D.C.: Center of Military History, United States Army, 2002), 573.

[239] Ibid.

than battlefield necessities.[240] The combat component of the branch's responsibilities experienced less progression from the SWPA, primarily due to those contextual realities. Engineer commanders and leaders in this theater of the war did not have the time or space to concern themselves with such a long-term consideration. Combat leadership requires practitioners to adapt to a particular point and time circumstances to accomplish the mission.

Throughout operations in the SWPA, combat engineer leaders and soldiers found it necessary to make expedient decisions outside the present doctrinal, which would become standard procedure. For example, utilizing a bulldozer blade to shield US infantry from Japanese small arms fire and then raze the latter's bunker exemplifies such an isolated battlefield resolution.[241] Commanders and leaders at the company or platoon level had to direct shovels, machetes, and pick-axes to facilitate the movement and maneuver of infantry, for example, in the dense jungle and steep ground of the Owen Stanley mountains across New Guinea.[242] Independent thinking and action by leaders and commanders at the US Army's tactical level were encouraged and demanded.

Senior leaders expected Lieutenants, Captains, Majors, and Lieutenant Colonels in the SWPA to assess the situation and take appropriate action. This often-overlooked element of US Army leadership doctrine contrasted with that of their World War II foes. *Field Manual* (FM) *100-5*, *Field Service Regulations: Operations* (1941), expresses this conviction of the service that combat leaders must primarily be critical thinkers and possess uncommon moral fortitude.[243]

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[240] Ibid, 574-6.

[241] Francis B. Catanzaro, *With the 41st Division in the Southwest Pacific: A Foot Soldier's Story*, (Bloomington, IN: Indiana University Press, 2002), 59-60.

[242] "The Yanks Close in on Buna," *The Sunday Star*, Gravure Section, 6 Pages of Pictures, January 3, 1943.

[243] United States Army, *FM 100-5, Field Service Regulations: Operations,* (Washington, D.C.: War Department, 1941), 19.

Similar to leadership analysis in the broader sense, the consideration of de-centralized combat leadership is challenging to qualify explicitly. However, examining this topic from the process perspective offers some objective elements regardless of individual characteristics. Again, combat is fluid and not static. Therefore, it is, or should be, self-evident that senior or strategic leaders physically separated from a given operation cannot sufficiently contextualize the situation in the immediate present. Thus, they cannot effectively direct tactical battles. Gen. George S. Patton defined this as combat leaders having the necessary authority equal to the degree of responsibility a leader, especially a commander, inherently holds.[244] Other contemporaneous senior Army leaders noted the inverse relationship between advanced munitions technology and the size or number of combatants.[245] The argument is that Napoleon's adage that in war, the character of the individual soldier and leader ultimately was the determinate factor in the outcome of combat.[246]

This vision of leadership and command offered the US Army combat engineer in the SWPA a tactical advantage compared to their Japanese counterpart. The Imperial Japanese Army (IJA) exercised command and control through a much more authoritatively rigid process. For the tactical combatant commander, there was much less, if any, latitude to veer from the respective higher commander's operational plans. The IJA's minimalization of tactics development compared to the US Army only expanded the latter's advantage during the war. For the combat engineer commander as part of the combined arms force, this meant being able to provide

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[244] Porter B. Williamson, *GEN Patton's Principles for Life and Leadership*, (Tucson, AZ: Management & Systems Consultants, Inc., 1988), 66-73.

[245] Brigadier General Edmund L. Gruber, "Leadership," *Military Review* XXI, no. 80 (March 1941), 6.

[246] Ibid.

specific engineer support or capabilities at the point most needed, per the task force commander's acquiescence, of course, and at the appropriate time to achieve the objective of the mission's decisive element. This represented cultural variances between Japan and the United States, influencing the war's prosecution and outcome.

Military history should be the exploration of the technical application of martial arts and science elements, as noted previously in this missive. It is unavoidable that an army is, to a relative degree, a reflection of its broader culture. The vignettes of combat engineer ingenuity applied to battlefield dilemmas and decentralized command and control reflect, in a narrow context, the mid-twentieth-century American cultural values of self-reliance and creativity. While these cultural values and implicit military principles applied across SWPA formations when applied to the combat engineers, their inherent influence increased.

First, the island-hopping and combined arms tactics, processes, and procedures were new Army operational missions in the war against Japan. These elements permeate the Army's historical record, but as derived and applied in the SWPA, these were innovative operational processes.[247] Procedural evolution that often occurred on the field of battle and addressed well the contextual realities of the SWPA, but not equally viable to the Mediterranean, for example. The Army and engineers did not have the time to analyze all the feedback emanating from each combat operation and then incorporate each appropriate lesson into the engineer program of instruction of training at Belvoir or Leonard Wood. Coll, Keith, and Rosenthal note that engineer equipment evolved little, if any, from 1941-45.[248] While true, that fact had little relevance to the

[247] Coll, Keith, and. Rosenthal, *United States Army in World War II: The Technical Services: The Corps of Engineers: Troops and Equipment*, (1958; repr., Washington, D.C.: Center of Military History, United States Army, 2002), 573.

[248] Ibid.

SWPA. Reiterating previous arguments, the realities of the SWPA were such that physical fortitude and mental acuity would influence the course of operations more than technology.

The US Army and Navy had insurmountable technological, industrial capacity, and human capital advantages over their Japanese counterparts.[249] That being true, it remained necessary for the US to transport men and material successfully to the appropriate location at the proper time and successfully apply them operationally. combat engineers demonstrated their ingenuity and correlating operational elasticity during the battle for Manila in 1945. Reluctantly drawn into the city for the first time in the SWPA, the US Sixth Army had to perform combat operations in an urban context instead of one primarily characterized by jungle terrain. The 37th Infantry and 1st Cavalry divisions, in their effort to defeat Japanese formations within Manila's limits and secure the city, came upon the obstacle of the Pasig River. Through individual initiative, the combat engineer leaders and soldiers overcame the operational conundrum by transporting assault troops across the river in boats while receiving Japanese fire and then by placing bridging to allow follow-on formations to cross.[250]

Beyond successfully facilitating this crossing, the combat engineers transitioned to reducing obstacles associated with an urban setting, buildings constructed of concrete, mine emplacements, movement restricted by city streets, and a list of other impediments.[251] Engineer

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[249] Ian W. Toll, *Twilight of the Gods: War in the Western Pacific, 1944-1945*, (New York: W.W. Norton & Company, 2020), 773.

[250] Dod, *United States Army in World War II: The Technical Services: The Corps of Engineers: The War Against Japan*, (1966, repr., Washington, D.C.: Center of Military History, United States Army, 1987), 616 and James M. Scott, *Rampage: MacArthur, Yamashita, and the Battle of Manila*, (New York: W.W. Norton & Company, 2018), 227.

[251] Dod, *United States Army in World War II: The Technical Services: The Corps of Engineers: The War Against Japan*, (1966, repr., Washington, D.C.: Center of Military History, United States Army, 1987), 617.

commanders then had the ironic responsibility for the subsequent rehabilitation of the city following the Japanese defeat.[252] This was within the responsibility and specialization of the service (construction) engineers, but interesting nonetheless. That tidbit of irony is that the very Army branch that enabled infrastructure destruction as an operational necessity was then the branch tasked with making good that devastation. Another aspect of the combat throughout Manila was the combined arms character of operations. The engineers continued to collaborate with the infantry, albeit under different circumstances. However, this time demonstrated the competence and effectiveness of the engineers operating with the Sixth Army's tank or armored formations.[253]

Characteristics of SWPA operations engineer leaders in situations like these inspired their engineer soldiers to succeed not through passionate soliloquy but action. As Carl Mann postulated, demonstrating personal bravery was another harbinger of effective leadership and command for the prospective engineer officer.[254] Mann and author speculators on the role and contributions of effective leadership reiterate the imprint of moral dexterity on the soldiers of a given unit. Commandant of the Army's Command and General Staff School in 1940, Brigadier General (BG) Edmund L. Gruber delivered a leadership recitation to incoming students. A point of emphasis was that besides being themselves, leaders had to recognize that as individual soldiers and collectively as a unit, they desire their respective leaders and commanders to lead well.[255] This again relates to the character of a commander and its foundational element of

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[252] Ibid.

[253] Ibid and *United States Army in World War II: The War in the Pacific: Triumph in the Philippines*, (1963, repr., Washington, D.C.: Center of Military History, United States Army, 2005), 288-89.

[254] Carl Mann, *He's In the Engineers Now*, (New York: Robert M. McBride & Company, 1943), 70.

[255] Brigadier General Edmund L. Gruber, "Leadership," *Military Review* XXI, no. 80 (March 1941), 6.

leadership. Combat engineer leaders repeatedly inspired and led their soldiers by being out front, doing themselves no more than they demanded of their respective formations.

Effective leaders demonstrated a team-first mentality and that despite their position, they too were good followers. Combat engineer doctrine could only have evolved during the war to the degree it did with such leadership first in training (an enduring requirement) and tactical experience. GEN MacArthur established a command climate up and down the SWPA chain of command by himself, demonstrating this by a willingness to take a risk in his island-hopping operations.[256] That no existing "blueprint" existed for executing such operations did not dissuade the theater commander from proceeding with these tactical processes in pursuit of his tactical and strategic goals. The engineers exemplified this by developing the amphibious capability bestowed upon the branch. Those with leadership in these units had to forge an entirely new organizational premise without the benefit of lineage to inspire their men.

The infantry division may have been the spine of the Army's SWPA combat entity, but it was the combined arms team or task forces through which GEN MacArthur and his commanders realized combat power. Beginning with the amphibious landings throughout New Guinea, the island-hopping operations performed by these task forces began with assault landings performed by the amphibious engineers.[257] Examiners of these operations and the operational practices comprising them may wish to dimmish the military foresight by implementing this specific capability based on geographical realities. Still, that fact cannot diminish the leadership required to proceed at the time without the benefit of historical hindsight. There were limited training and

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[256] Theodore Kinni and Donna Kinni, *No Substitute for Victory: Lessons in Strategy and Leadership from General Douglas MacArthur*, (Upper Saddle River, NJ: Pearson, 2005), 7.

[257] Brigadier General William F. Heavey, *Down Ramp! The Story of the Army Amphibian Engineers*, (Washington, D.C.: Infantry Journal Press, 1947), 60.

rehearsals before the initial operations in the Nassau Bay and Salamaua areas. Regarding the latter, the assigned task force performed only one incomplete rehearsal.[258] This scenario required considerable trust among the engineer soldiers and their leaders, not to mention the assault troops, that these assigned units could complete the amphibious assault.

Another element of BG Gruber's admonition and GEN MacArthur's leadership philosophy emerges at this point. Trust between soldiers and their leaders is mutual. It also is horizontal in that each leader or commander of the combat teams organized in the SWPA theater required it amongst each other as an element of operational planning, preparation, and execution. Like all US Army soldiers and warriors throughout history, the combat engineer had to trust that their leaders and commanders would look after their sustainment needs, training, and equipping to be sure. But they also had to rely on those who would effectively command them in battle. Many of the circumstances and characteristics associated with the SWPA were "new" to the combat engineer soldier, their commanders, and the Army itself. Therefore, the soldiers had to trust that their leadership would have the aptitude and initiative to respond to these realities effectively and, moving forward with subsequent operations and their input, derive practices and procedures to succeed.

From a variety of angles, trust reflects a pointed truth. If it does not exist throughout a military organization, victory is inconceivable. Worse yet, the potential for unwarranted loss of life becomes a persistent unit contagion. Within the combined arms framework, the infantry and armored leaders had to trust that the combat engineer commander and soldiers would adequately facilitate their actions. The isolated and rudimentary context of the SWPA challenged this axiom. The Army prepared for a different war in every facet. Its engineers and other branches and

[258] Ibid, 61.

services likewise encountered more than diametric geography from their training scenario—still, an opposing army with different doctrines emanating from cultural elements than that of Nazi Germany. Leaders facilitate trust within a formation as it is not an inherent ingredient. Still, the margins associated with results were skinny; therefore, its omnipresence was critical.

Doctrine in military parlance is the tactical or operational outline. The canvas that a leader provides shapes and colors upon. Commanders, leaders, and all soldiers had to learn that doctrine does not provide the answers to the crucible of combat operations. It outlines the foundational basics of every aspect of military activities. What it does provide for the practitioners of martial arts and science is what to study. What engineers must accomplish to be successful was, and remains to this day, the aim of engineer doctrine. Doctrine, and in this case, engineer doctrine, is not exclusively the domain of officers and other leaders. The Army expected all combat engineer soldiers assigned to units serving in the SWPA to have a functional knowledge of their doctrine. Senior commanders entrusted subordinate staff officers, leaders, and unit commanders with the responsibility to ensure this was the case.

It was and is true of doctrine that it is not transcendent or static. The volume and short duration between revised publications produced during World War II illustrate this reality. Within the engineer discipline alone, the researcher must only examine at least five manuals revised and updated between 1940 and 1944.[259] The engineer branch was an adaptive organization that valued tactical experience and constant learning. A leadership trait that the Army codified as life-long learning. The post-war reports of the SWPA engineers reflect the inextricable association

[259] The five field manuals uncovered in research associated with this dissertation are *Field Manual (FM) 21-105 Engineer Soldiers Handbook, FM 5-5 Engineer Field Manual: Engineer Troops and Operations, FM 5-15 Field Fortifications, FM 5-20 Camouflage,* and *FM 31-20 Jungle Warfare*. The US War Department, Washington, D.C, published all.

between doctrinal development, revision, and leadership.[260] The authors of these reports outline the challenges faced by the SWPA engineers throughout the war and how those experiences influenced and affected the US Army engineer creed and operational processes. No explicit discussion within these volumes offers analysis concerning leadership and its imprint on this topic. However, as they remark upon these experiences, the commentary includes recounting how engineer commanders and leaders responded to the distinctive realities of each situation.

In a practical sense, the US Army, and its SWPA engineers during the opening months of the war had a paradoxical affiliation with doctrine. The engineers then had to support the threadbare combat elements of MacArthur's formations with what they had at their immediate disposal. At the same time, doctrine in terms of field manuals did (and do) not direct the specific means or tools for mission accomplishment. What the manual provided was the desired engineer end state. Technical manuals offer the means and methods associated with a given implementation. The ingenuity of soldiers adapting to the situation and identifying practices that could be applicable throughout the SWPA was for leadership to capture and provide structure. Engineer doctrine, with its topographical emphasis, could never be universally applicable. Procedures and even implements sufficient for engineer utilization in the SWPA theater are unlikely to yield similar outcomes in the Aleutians. The desire for standardization to streamline training and tool procurement required mollification by leaders and commanders at all levels.

The Army's introduction of the triangular (infantry) division and the correlating incorporation of a divisional engineer battalion initiated doctrinal accommodation. Not so many distinctive adaptations to the divisional engineer's responsibilities or battalion's capabilities, but

[260] Office of the Chief of Engineer, Major General Hugh Casey, Engineers of the Southwest Pacific 1941-45, Volume I: Engineers in the Theater Operations, Reports of Operations United States Army Forces in the Far East, Southwest Pacific Area, Army Forces Pacific, 1947, 134-137

the entire division, holistically. This required the engineer branch to consider how this organizational structure affected the branch's doctrinal elements in the context of the triangular division's operational faculties. Of course, the doctrine could not address or account for the finite commodity that has historically always been in insufficient supply to military practitioners, that being time. US Army engineer officer Lieutenant Colonel (LTC) Warren S. Everett, in his 1943 article analyzing the engineer role within this recent organizational configuration, noted such.[261] Time, Everett insists, is an unavoidable consideration and factor of engineer operations.[262] Naturally, that is true of all military operations; however, in this context and how Everett presents it, time is essentially a doctrinal element that the division or task force commander and divisional engineer must be ever cognizant of. Time represents an unchangeable element of doctrine because commanders and planners could not acquire more or stockpile for subsequent utilization. While it was and remains to this day a contributing factor and element of engineer (and all military) operations, it requires leadership (not solely commanders) for appropriate utilization of time. Researchers have enumerated throughout the historiography of warfare, the operational art in the context of leadership, and the connection to doctrine.

This hints at another element that intersects with leadership and doctrine, in this case, engineer doctrine, precisely, the imprint of military history. The study of military history has various applications in the physical world. This is an inevitability for the military professional and has been throughout time. In an essay concerning the need for military history as a facet of professional US Army officer development, COL Thomas Griess references an interwar service

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[261] Lieutenant Colonel Warren S. Everett, "The Engineer Component of the Infantry Division," *Military Review* XXIII, no. 7 (October 1943), 59-60.

[262] Ibid.

publication that characterizes military history as the "laboratory phase of military science."[263] Doctrinal innovation in the present is always the product of the past. Whether from the immediate or current operational experience or a conglomeration of the present and vignettes of more bygone ventures. Doctrine is, as another World War II era officer supposes, only valuable for its application.[264]

For SWPA engineer commanders and planners, the only means available for operational preparation in the war's opening months were historical records infused with current doctrine. As the combat engineer experiences throughout the SWPA theater accrued, leaders had a more exhaustive historical (immediate) database to apply to doctrine. However, the expanding operational history also afforded the theater and service-level engineer leaders the information necessary to affect doctrinal modification. The US Army did not demand that their officer and non-commissioned officers be historical experts in the sense of the historical method in the strictest sense. But they did and continue to this day expecting them to have a working appreciation for military history in a practical sense. The service throughout the war continued incorporating history and doctrine as fundamental elements of leadership pedagogical preparation and development. Army senior leaders did not intend history, like doctrine, to be a definitive how-to manual for commanders, planners, or all tactical leaders. What history and doctrine offered SWPA engineer leaders was a more extensive erudition from which they might apply military art to accomplish the broader scientific (strategic) war aims.

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[263] Colonel (COL) Thomas E. Griess, "A Perspective on Military History," in *A Guide to the Study and Use of Military History*, ed. John E. Jessup, Jr., and Robert W. Coakley (1979, repr., Washington, D.C.: Center of Military History, United States Army, 2004), 29.

[264] Lt. Col. Snyder L. Peebles, "Doctrine of Applied Doctrine," *Military Review* XXII, no. 8 (November 1943), 9.

Doctrine is a rudimentary element of war or, more precisely, of how combatants conduct war. Clausewitz supposed such in his abstraction of the theory of war. He thought that in conducting martial operations, an army utilizes the means available to each military.[265] Therefore, the relative means have inherent methods that the practitioners believe afford them the perceived advantage over their opponent. He also presents the argument that the nature of war is not static. In practical terms, the natural or physical realm influences combat operations and combatant formations' capabilities. US Army combat engineer operations in the SWPA certainly reflect this supposition. But the observer must point out that doctrine and, thus, combat operations do not innately transpire simply due to two opposing forces encountering each other.

For combat operations to culminate successfully, as one intends, it requires deliberate human involvement. Of course, soldiers responsible for performing the tactical actions necessary to achieve the desired outcome must require training in tactics and the appropriate employment of their respective martial tools and munitions. It is here where leadership completes the tactical and operational puzzle. Tactical leadership has inherent elements, externally visible and others not so objective, necessary for successful performance. But Clausewitz emphasizes a transcendent trait related to doctrinal utilization: decisions made by leaders during battle.[266] The unavoidable component of human participation again emerges as the final arbiter in conducting combat.

If combat engineer doctrine offered the generalized framework by which these soldiers and their leaders were to influence a combat operation, it had to have individuals with the

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[265] Carl Von Clausewitz, *On War*, ed. and trans. Michael Howard and Peter Paret (Princeton: Princeton University Press, 1976), 127.

[266] Ibid, 240.

requisite abilities and training to implement it. Elements of doctrine as applied in the maneuver support of infantry on New Guinea in 1942 were not unilaterally applicable to infantry tactical movements on Luzon in early 1945. Combat engineer leaders, and soldiers, had to adapt to the unique circumstances associated with time and place. This reality, too, reflects another of Clausewitz's observations that war, in a practical sense, is not static.[267] The nature of war, which the observer might define as at least two opposing armed groups engaging in combat, is, in that sense, immutable. However, the example of World War II displays that the character of war emanates from external factors associated with where a given operation is occurring, the time of year, and participant capabilities at a given time. The doctrine must be malleable to effectively meet these challenges while simultaneously standardizing the methodology for efficient implementation outside of time and place.

The most sanguine example of doctrinal evolution is the US Army's jungle combat field manual, *FM 31-20* (1941 version) and *FM 72-20* (1944). The service and an undeterminable number of soldiers before 1941 had some ancillary experience with planning and executing combat operations in a jungle environment. That experience is associated chiefly with Philippine tours of duty. By 1944 and the publication of *72-20*, the researcher may find three examples of editions most assuredly related to the Army's SWPA operational experiences after December 1941. First and most apparent to the historian is the elimination of discussion for using animals in combat operations.[268] World War II was what contemporaries and military professionals recognized as the transition point to fully mechanized warfare. Case and point, the Army's 1st Cavalry Division, slated for eventual service in the SWPA, had to surrender all their horses

[267] Ibid, 127.

[268] United States Army, *FM 72-20, Jungle Warfare,* (Washington, D.C.: War Department, 1944).

before deployment—a significant emotional event for those welded to a centuries-old means of warfare.[269] This breakneck conversion, in hindsight, appears gratuitous considering the topographical and infrastructure realities the division and Army would encounter in the SWPA. Notwithstanding, this transition reflects the evolutionary character of war. Another example is the appreciation that Army engineers and all leaders developed for personal hydration.[270]

It may be supposed that army leaders and doctrinal authors were holistically unaware of the importance of water consumption to soldiers. The 1941 Jungle Warfare manual discussed the propensity for higher temperatures and humidity in such environments. This volume did not address how to mitigate these conditions' effects through increased hydration. Of course, soldiers and leaders had to learn this through the proverbially less pleasant way of experience. The 1944 volume not only addresses this in general terms, applicable to all personnel performing duty in such a setting but explicitly by name, identifies engineers by the nature of their tactical and service (support) responsibilities to be especially vulnerable to dehydration.[271] This doctrinal element would have been of concern for the combat engineer commander and leader, for losing soldiers to non-combat maladies has retarding effect on the unit's operational readiness.

The third and most pronounced variance between the 1941 and 1944 versions concerns the latter’s explication of operational time. [illegible] Time, of course, is an inherent consideration in all tactical operations. Within the context of a jungle environment, considering time, the authors of *72-20* surmise, is with the amount of time required to maneuver and move between given points

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[269] John C. McManus, *Island Infernos: The US Army’s Pacific War Odyssey, 1944*, (New York: 2021), 4.

[270] United States Army, *FM 72-20, Jungle Warfare,* (Washington, D.C.: War Department, 1944), 29.

[271] Ibid, 29.

instead of the number of miles between.[272] A survey of the engineers' SWPA operational history illustrates how the restrictive nature of the topography affected a unit's ability to arrive at an assigned point and the correlating time and impact on the overall mission. Operational experience of those in the SWPA taking the lessons of these operations with them to follow-on assignments, especially those assignments stateside that were in the training, strategic planning, and doctrinal penmanship roles.

Combat engineer doctrinal transformation, to what degree that may have been, was in the physical reality, relative to the unit's respective theater of war between 1941-45. That is not to contend that it was then irrelevant for consideration in future, then unknown wars or tactical operations. Quite contrary, Army leadership identified elements of each theater thought to be universally applicable that the Army's engineer sought to incorporate into contemporaneous doctrinal precepts. But such an acknowledgment tacitly acknowledges the critical role of leadership in combat engineer and all Army tactical operations.

Clausewitz argues that armies fight a war within the "realm of uncertainty." [illegible] If that is to be the persistent state of combat, it requires a specific skill set among select individuals to plan and lead its conduct. Leadership is the connective tissue that brings coordination to all the other elements of military operations. But in an apparent contradiction, qualifying unilaterally is the most challenging element. For the combat engineer and all other units of the SWPA in the opening months of the war, this was especially troublesome due to the wholesale absence of combat and even operational experience. Despite the engineers' pivot from a general engineer role to one more aligned with the Army's transition to a more mobile, technologically centric

[272] Ibid.

force. This challenge for the engineers was further complicated by the introduction of new operational requirements, specifically that of amphibious operations.

The increased specialization of existing capabilities into intended-use units was associated with the imposition of new tactical duties. The engineers then faced a training puzzle associated with all assigned soldiers and their leaders and commanders. This branch evolution also affected engineer doctrine as well. As it were, the tools of the trade experienced little transition during the war. This is unsurprising, considering the Army and its engineers had to fight a worldwide war. Thus, it fell to the service and branch leaders to adapt their military implements and munitions to the circumstances within which they found themselves. In this scenario, a need to effectively identify those displaying the requisite skills for leadership the Army had to appropriately train for such a responsibility.

However military historians and professionals must understand that the fundamental responsibility of leadership is not necessarily to be the most proficient tactical operator. It is to care for those within their charge. Leaders, more than anything else, should be relational first to those they are to lead, their peers, and of course, higher commanders. Major Dick Winters of the well-known *Band of Brothers* postulated that an effective Army leader must primarily be honest.[273] For the combat engineer leaders of the SWPA engineer units to earn their soldiers' trust, they had first to have confidence that their leaders, primarily, had their best interests always in mind. Each engineer officer and the non-commissioned officer would have their degree of tactical proficiency. Soldiers now, as then, could accept that reality if they could believe that their

[273] Colonel (Col.) (RET.) Cole C. Kingseed, USA, *Conversations with Major Dick Winters: Life Lessons From the Commander of the Band of Brothers*, (New York: Caliber, 2014), 66.

leaders and commander would do right by them. That began with honesty in all matters and situations, regardless of the circumstances.

That said, it was also incumbent for leaders to effectively and constantly prepare or train their soldiers and units for combat operations. This, too, is elementary to caring for soldiers. Taking unprepared or untrained formations into combat is a dereliction for the Army leader and commander. Thus, while it is optional for each leader to be the most technically or even tactically proficient soldier, they must yet contain a level of knowledge sufficient to train their soldiers and units effectively. This is where doctrine and some historical appreciation associated with big-picture Army operations, specifically one's branch, come to the fore.

Every human pursuit or occupation has an established set of precepts that outline the expected outcomes of associated actions. The military is no different. Doctrine is how the Army most often qualifies this wide array of martial principles. But there are two considerations that the combat engineer leader or commander in the SWPA had to comprehend. First, Army doctrine is not a descriptive procedural containing a prescribed set of steps for a combat leader to meet every combat eventuality. That is impractical. Army doctrinal writers could only account for some battlefield situations. Higher commanders expect subordinate combat leaders to have the necessary doctrinal comprehension combined with individual intellectual capability to effectively employ their units and associated capabilities to meet a given situation best. Second, doctrine, like the characteristic of war itself, is motile. It changes as time, technology, and circumstances require it. Army leadership implies or, at times, explicitly directs tactical leaders to capture the lessons learned during their respective battlefield experiences and provide that to higher leaders, eventually arriving at the highest levels of Army leadership. The Army, through persistent doctrinal analysis, incorporates elements of lessons learned and edits doctrine, as necessary.

Chapter V:

US Army and Combat Engineer Doctrinal Adaptation and the SWPA

The tactical realities of the SWPA theater reflected more than influenced the evolution of the US Army combat engineer doctrine between 1942 and 45. The SWPA theater's non-existent infrastructure and austere topography exasperated the inherent essentiality of engineer capabilities to combat operations. This reality made implementing technological advancement a low priority. Coll, Keith, and Rosenthal implicitly concur with this conclusion that scant engineer equipment enhancement occurred during the war. OBJ The tactical responsibilities of the engineers did not change due to the context of the theater. However, the techniques and tools by which the engineers achieved the dictated end states would have to adapt to those physical realities. Availability of the most current engineer tools and shipping also contributed to the operational design. Like the entirety of the Army's SWPA formations, the combat engineers' formations emerged from the turbulent transition year of 1942, primed to undertake expanded offensives in 1943.

Gen. MacArthur, his strategic aim assigned by the US Joint Chiefs of Staff, was Japan's primary logistical and operational base at Rabaul.[274] This garrison situated on the east coast of the island of New Britain was to be the objective from which all intermediate SWPA planning would connect. The sober environment of the SWPA made logistic facilities and airfields strategic priorities. It may be supposed that the Pacific War comprised a series of mutual supporting operations to secure islands to establish new or existing ports and airfields. The Army's engineers became an indispensable element of SWPA operations in each unit type or capability. The theater commander demonstrated his appreciation of this fact when he

[274] Ian W. Toll, *The Conquering Tide: War in the Pacific Islands, 1942-1944* (New York:

characterized the war in this region as a war that elevated the operational importance of the engineer branch.[275]

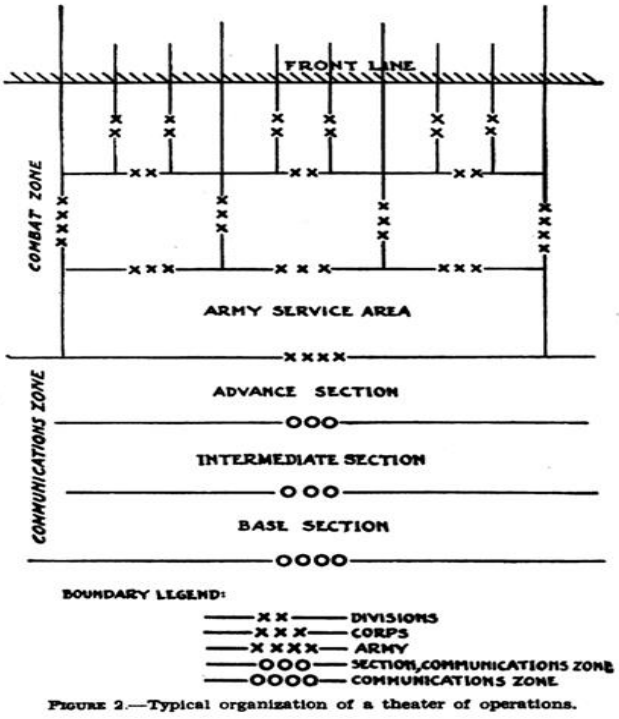

Figure 3: Illustration of the US Army's "typical" structure or organization of a theater of operations during the World War II era. Picture from United States Army, *FM 100-10: Field Service Regulations: Administration*, (Washington, DC: United States War Department, 1940), 8.

The SWPA combat engineers' contributions to any engineer doctrinal refashioning between 1942 and 45 the student may best scrutinize through a sampling of two operations. For this project, a mission from 1943, representing an early offensive assault, and the other from 1945 affords the best comparison. The selection of the former included the engineers' early implementation of the new operational requirement of performing amphibious operations. The selections are the assault upon New Britain in 1943 and what the researcher might characterize

[275] Office of the Chief of Engineer, Major General Hugh Casey, *Engineers of the Southwest Pacific 1941-45, Volume I*: *Engineers in the Theater Operations*, Reports of Operations United States Army Forces in the Far East, Southwest Pacific Area, Army Forces Pacific, 1947, 90.

as the SWPA's capstone operation of invading the Philippine Island of Luzon. Historian Edward Drea noted that Rabaul, New Britain, beyond being Japan's primary operational base, also represented an obstacle astride MacArthur's line of advance to his ultimate objective of the Philippine Archipelago.[276]

Before strategic consideration, practical consideration warrants a brief explication of the engineer organizational structure within these operational organizations. The formation of operational SWPA, from 1943 onward, emanated from the target of each mission objective(s), unit availability (by type), and shipping capacity. The latter consideration often being the determining component for officers on Gen. MacArthur's and his subordinate commanders' headquarters staffs. These planners also had to acquiesce to reality. Most notably, incorporating engineer service (construction) units into earlier phases of each mission or operation than typical. This resulted in instances in which engineer carpenters or truck drivers also fought as and alongside infantrymen.[277] The near complete absence of existing infrastructure and airfields on these isolated and austere Pacific islands made these units need to perform their tasks in the forward areas or combat zones (Figure 2).

The topographical realities of the SWPA, combined with the strategic priority of airstrips, necessities the utilization of typical communications zone assets (engineer service units) in the combat zone. It is also why the War Department assigned to the engineers the new operational role of executing amphibious missions and the associated doctrinal development. The absence of roads or even passable trails that characterized the islands within the SWPA contributed to this

[276] Edward J. Drea, *New Guinea,* The U.S. Army Campaigns of World War II (Washington, D.C.: Center of Military History, United States Army, 1991), 3.

[277] Karl C. Dod, *United States Army in World War II: The Technical Services: The Corps of Engineers: The War Against Japan*, (1966, repr., Washington, D.C.: Center of Military History, United States Army, 1987),

tactical situation and introduced another doctrinal innovation. The utilization of airborne qualified engineers.[278] These soldiers did not jump from planes in flight, such as infantry, but utilized transport aircraft to lift them and their engineer equipment, such as dozers, to their objective area to construct roads and, more importantly, airfields.[279] These units secured their project sites and personnel in such circumstances.[280] This bolsters the notion that the seizure of islands to establish mutually supporting logistical nodes and airfields was the penultimate strategic necessity of the SWPA and Pacific War overall.

It also furthers the supposition that this conflagration was, at its essence, an engineer's war. Similarly, combat engineer units, battalions, companies organic to the infantry divisions, and separate entities such as Engineer Group headquarters and attached or assigned subordinate combat units often had to expand their construction mission to enable infantry or armor mobility capabilities. Operational realities such as the SWPA operational theater presented the US Army's engineers with a unique and challenging laboratory to assess doctrinal precepts. Simultaneously the SWPA represented an antithetical environment for contemporaneous doctrinal examination due to the austere reality. Thus, in the SWPA, we often witness the odd conglomeration of twentieth-century warfare with nineteenth-century support. Naturally, this contradiction lessened with the war's progression, and the 1945 operations on Luzon demonstrate this contextual factuality. This island contained more modern infrastructure, and the city of Manila mirrored conditions in the European Theater of Operations more than the balance of the SWPA.

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[278] Ibid

[279] Ibid

[280] Ibid

Analysis of combat engineer operations in the SWPA through the lens of doctrine also requires the researcher to acknowledge the element of logistics and shipping. The US, while by far the industrial behemoth of World War II, still needed to supply large-scale operations across the globe. As repeated throughout this research project, Europe was the strategic priority throughout the war. MacArthur and his combatant commanders had to make do. Still, their needs were often difficult to meet due to the persistent shortage of available shipping vessels to transport soldiers, equipment, and supplies. SWPA planners always had to incorporate these constant irritants into their operational schemes. Most importantly, it affected operational timelines, which was undoubtedly true of CARTWHEEL and the invasion of Luzon.

Throughout 1942 and into 1943, Japan's principal garrison at Rabaul represented the initial US objective as it sought to roll back the former's imperial gains during the previous two years.[281] With its elimination and the seizure of airfields on the island, New Britain set the conditions for subsequent operations to the north and west. Simultaneously, MacArthur would continue to move along New Guinea's north coast with operations supporting the invasion of New Britain. Also supporting this main effort, Adm. Halsey supported the move on Rabaul with his ongoing missions throughout the Solomon Islands. Maj. Gen. Hugh Casey's staff recounts that the fourteen engineer units' assignment within CARTWHEEL was extensive and complex.[282] It consisted of repairing and improving captured airfields, or the construction of new ones, port establishment, establishing lines of communication, eventually constructing structures

[281] John Miller, Jr., *United States Army in World War II: The War in the Pacific: CARTWHEEL: The Reduction of Rabaul,* (1959, repr., Washington, D.C.: Center of Military History, United States Army, 1995), 1.

[282] Office of the Chief of Engineer, Major General Hugh Casey, *Engineers of the Southwest Pacific 1941-45, Volume I*: *Engineers in the Theater Operations*, Reports of Operations United States Army Forces in the Far East, Southwest Pacific Area, Army Forces Pacific, 1947, 90.

to support communications zone operations, and most importantly for this dissertation, support of the infantry units' assaults.[283]

CARTWHEEL and the Pacific War, in general, dictated that the US Army conquered the very real obstacle presented by the waters of the Pacific Ocean. CARTWHEEL represented the first operational utilization of the Engineer Special or amphibious brigades for implementing the island-hopping tactical methodology.[284] Some argued that the progression of military munitions before and during the war rendered the need for soldiers or marines to engage the Japanese in direct, ground combat. That air power and maritime supremacy could win the war. But that represented a conclusion devoid of empirical substantiation and countered by the war's course in the Pacific and Europe.

The nature of the operational environment often required ingenuity from the combat engineers' rather than doctrinal literacy.[285] Considering doctrine within the context of the engineers' SWPA combat experience is the supposition to the following question. Was operational design and tactical application by 1945 directly correlated to explicit doctrinal adaptation or combat experience? A conglomeration of both, perhaps? The difficulty with ascertaining a distinct doctrinal evolution from operational experiences is that military and US Army doctrine has never been definitive in a universally applicable connotation. Another characteristic of the SWPA affecting such an analysis is that each succeeding objective, in this case, islands replicated their austerity. Therefore, engineering effort likewise became repetitive

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[283] Ibid.

[284] Brigadier General William F. Heavey, *Down Ramp! The Story of the Army Amphibian Engineers*, (Washington, D.C.: 1947), 51.

[285] Robert Ross Smith, *U.S. Army in World War II: The War in the Pacific: Triumph in the Philippines*, (1963, repr., Washington, D.C.: Center of Military History, United States Army, 2005), 130.

with scant opportunities for significant progression deeper into operations the Army traversed. During World War II and heretofore, engineer doctrine is necessarily broad and generalized in scope, correlating to the expansive register of the engineer branch's operational responsibilities.[286] This wide swath of engineer tactical considerations suffuses the historical records of the CARTWHEEL and Luzon campaigns.

CARTWHEEL represented Gen. MacArthur's and his SWPA commanders' initial offensive operation. Operations in northeastern New Guinea, while containing operations such as at Buna Station and along the Kokoda Trail, from a doctrinal viewpoint, characterize a mobile defense (counterattack).[287] That is precisely what the theater commander intended them to be as this all nested within the March 1942 directive from the Joint Chiefs and for MacArthur to, among other tasks, at the appropriate time, seize the initiative.[288] The "revised" Joint Chiefs directive of March 1943 refined the previous one by outlining more specific strategic objectives resulting from this initiative seizure or offensive.[289] Situated as the first large-scale offensive is inherently significant. The engineers of CARTWHEEL consisted of units organic to Lt. Gen. Walter Krueger's Sixth Army and other engineer units directly assigned to GHQ, SWPA, and the responsibility of MacArthur's Chief Engineer, Brig. Gen. Hugh Casey; this operation was especially noteworthy with the new amphibious element.[290]

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[286] United States Army, *FM 5-5: Engineer Field Manual: Troops and Operations*, (Washington, DC: United States War Department, 1941), 1-2.

[287] United States Army, *FM 100-5: Field Service Regulations: Operations*, (Washington, DC: United States War Department, 1941), 152.

[288] Samuel Milner, *U.S. Army in World War II: The War in the Pacific: Victory in Papua*, (1957, repr., Washington, D.C.: Center of Military History, United States Army, 1989), 23.

[289] Miller, *United States Army in World War II: The War in the Pacific: CARTWHEEL: The Reduction of Rabaul,* (1959, repr., Washington, D.C.: Center of Military History, United States Army, 1995), 19.

[290] Major General Hugh Casey, *Engineers of the Southwest Pacific 1941-45, Volume I*: *Engineers in the Theater Operations*, Reports of Operations United States Army Forces in the Far East, Southwest Pacific Area,

This operational element was a, if not the prominent element of, the SWPA and the war in general, considering the US, its allies, and Japan fought it across the Pacific. CARTWHEEL's sub-operations combined Army and Navy affairs, meaning the action was necessary for the air, land, and water. The islands or land masses targeted in this operation were New Guinea, the Solomon Islands, and the Bismarck Archipelago. [291] Navy retained its role and responsibility for transporting men, material, and supplies at the theater or strategic level. At the tactical level, the transport (mobility) of the respective formations and accruements would now primarily, but not solely, be within the purview of the Engineer Special Brigade or amphibious engineers.[292] Mobility was and remains an essential engineer task. This theater was a maritime operational area, amphibious mobility was an obvious necessity, and naturally, senior Army leaders presumed the engineers were the existing branch best suited to absorb it. Also characteristic of this operational area lending itself to the elevated profile of engineers was the reoccurring theme of this region's onerous physical setting.

American successes and the intervening years since the conclusion of World War II have resulted in researchers overlooking Pacific War amphibious operations. This neglect is not a conscious effort but a product of omission as historians focuses their attention on operational elements after maneuvers, assaults, and landings. The amphibious phase of these operations was inherently complex and risky. A subsequent chapter of this research examines in detail the amphibious engineers, including the development of this capability, relating to soldiers,

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Army Forces Pacific, 1947, 89 and Miller, *United States Army in World War II: The War in the Pacific: CARTWHEEL: The Reduction of Rabaul,* (1959, repr., Washington, D.C.: Center of Military History, United States Army, 1995), 50.

[291] Miller, *United States Army in World War II: The War in the Pacific: CARTWHEEL: The Reduction of Rabaul,* (1959, repr., Washington, D.C.: Center of Military History, United States Army, 1995), 22.

[292] Brigadier General William F. Heavey, "Amphibian Engineers in Action: Operations in the Southwest Pacific Area," *The Military Engineer* XXXVI, no. 223 (May 1944), 146.

equipment, and doctrine. Similarly, the deep content of World War II and its multitude of operational history has overlooked other doctrinal elements that contributed to strategic victory.

These thirteen amphibious operations also required Lt. Gen. Kenney and his SWPA Fifth Air Force to attain and maintain control of the airspace above each operational area. As noted, CARTWHEEL's intermediate and terminal objectives were airfields with naval port capabilities and the defeat of Japanese land or garrison formations' secondary aspirations. CARTWHEEL, in operational doctrine, was effectively self-serving. Mastering the air was a prerequisite to executing each succeeding operation of seizing existing or constructing new airfields by defeating the Japanese.

Brig. Gen. Heavey points out the tactical level of surprise as an inherent positive for the operational commander afforded by amphibious assaults.[293] This was true regarding the CARTWHEEL missions but was also relative. Tide, coral reef, beach conditions, and presumed Japanese emplacements and responses to each assault rendered surprise, if realized, relative to the conditions of each operation. While achieved throughout CARTHWHEEL's multiple amphibious assaults, the US 1945 invasion of Luzon offers a contrasting illustration. Such a reality did not contain a correlating alteration in amphibious doctrinal design or application.

Geographic and Japanese capability variance between these two operations resulted in unique doctrinal considerations for the Sixth Army and, specifically, the engineers. Of course, invading, and seizing Luzon would be a much larger operation than CARTWHEEL based on the island's size, position, and the considerable number of Japanese formations occupying it. Strategically, the objective remained like that of CARTWHEEL, the seizure of Luzon and the

[293] Heavey, *Down Ramp! The Story of the Army Amphibian Engineers*, (Washington, D.C.: 1947), 61.

Philippine archipelago overall as a staging and operational base for future operations.[294] The Luzon operation was in the larger strategic view, mutually supporting Adm. Nimitz's Central Pacific assault of Iwo Jima.[295] The US Joint Chiefs of Staff commissioned both of these operations with the eventual operational intention of invading the Japanese home islands, as utilization of the atomic bombs was not yet a strategic or operational consideration.[296]

From the perspective of the amphibious doctrinal application of these respective operations, they are homogenous. Researchers could argue that variance in tactical execution was due to advanced proficiency by executing soldiers, sailors, and planners who likewise had honed their skills during the preceding operations. The irony, if appropriate, was that Lt. Gen. Krueger and his Sixth Army planners, following considerable planning working groups, determined the best doctrinal and pragmatic way into Luzon, which was identical to how Japan had done so in the fall and winter of 1941.[297] Lingayen Gulf on the island's western coast offered the most coherent approach to the central plains region and, ultimately, the emblematic capture of Manila.

Complexity remained a persistent companion once the engineers, infantry, armor, signal, and supply formations put upon the Luzon, New Guinea, and New Britain landing zones and correlating debarkation sites. Assured mobility of friendly formations is one of the engineers' doctrinal tenets. The facilitation of amphibious operations planned and performed in World War

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[294] Smith, *U.S. Army in World War II: The War in the Pacific: Triumph in the Philippines*, (1963, repr., Washington, D.C.: Center of Military History, United States Army, 2005), 17.

[295] Ibid, 16.

[296] William A. Renzi and Mark D. Roehrs, 2nd ed. *World War II in the Pacific*, (New York: Routledge, 2004), 218.

[297] Kevin C. Holzimmer, *General Walter Krueger: Unsung Hero of the Pacific War*, (Lawrence, KS: University Press of Kansas, 2007), 210.

II's SWPA represents one example of such maneuvering within the combat zone.[298] That requirement was inherent to the engineer mission and has been to all armies throughout military history. The experience unique to the CARTWHEEL and Luzon operations did not alter that principle or the others of inhibiting enemy mobility and general engineering or construction activities. Even introducing the new amphibious mission did not represent a doctrinal revolution. What it did constitute was the requirement for doctrine associated with how these amphibious units and soldiers were to achieve assured mobility in tactical implementation.

Throughout CARTWHEEL especially, the planning consideration and tactical effort ascribed to mobility from the landing areas to each specific objective garnered considerable attention.[299] This work has noted that the general absence of infrastructure to facilitate twentieth-century military operations influenced operations. This contextual reality emanated from the extremely rugged nature of the islands comprising CARTHWHEEL's plans. This necessitated SWPA and Sixth Army planners to tailor their task forces to this fact. Combat engineers and, in specific instances, service engineers were habitually at the forefront of these deliberations to meet the maneuverability requirements of the combat formations in these challenging conditions. It did no good to place infantry, artillery, and armor units upon these isolated islands to seize objectives if they could not maneuver first to engage Japanese occupying formations.

Maneuver and mobility were forefront of the combat engineers' operational concerns during the latter Luzon campaign. Geographical conditions and the Japanese altered the specific operational and, therefore, doctrinal priorities for the engineers in Luzon relative to their

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[298] United States Army, *FM 5-5: Engineer Field Manual: Troops and Operations*, (Washington, DC: United States War Department, 1941), 1 and United States Army, *FM 5-5: Engineer Field Manual: Troops and Operations*, (Washington, DC: United States War Department, 1943), 21.

[299] Major General Hugh Casey, *Engineers of the Southwest Pacific 1941-45, Volume I*: *Engineers in the Theater Operations*, Reports of Operations United States Army Forces in the Far East, Southwest Pacific Area, Army Forces Pacific, 1947, 90.

CARTHWEEL experiences. The former circumstances, most notably the considerable number of gap or water crossings and the eventual urban combat experienced in and around the Philippine capital city of Manila.[300] To maintain the initiative and tempo of the campaign, engineers in Luzon, from Lingayen to Manila, leapfrogged temporary bridges from one river or crossing site forward. Inherent to this crossing mission was the responsibility for reconnoitering existing bridges to determine a) status, i.e., did a given bridge remain usable, and b) the capacity of each such structure.[301] The requisite information was, could an existing civilian bridge bear the weight of the US Army's military vehicles and equipment? This was critical in the Luzon campaign, representing the first large-scale utilization of US Army armor in the SWPA theater. [302]

There is another doctrinal element associated with both the combat and service engineer components, and that is reconnaissance. Information is an essential input in planning and decision-making for all operational elements. For the engineers, reconnaissance activities center upon not only enemy information, especially enemy engineer capabilities, but topographical information relative to the area of operations.[303] In the period leading up to and throughout the execution of CARTWHEEL's operations, engineers, from officers assigned to GHQ, and SWPA to the smallest elements, such as platoon and squad levels, conducted engineer reconnaissance missions.

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[300] Smith, *U.S. Army in World War II: The War in the Pacific: Triumph in the Philippines*, (1963, repr., Washington, D.C.: Center of Military History, United States Army, 2005), 232-3 and 289.

[301] Dod, *United States Army in World War II: The Technical Services: The Corps of Engineers: The War Against Japan*, (1966, repr., Washington, D.C.: Center of Military History, United States Army, 1987), 590.

[302] Smith, *U.S. Army in World War II: The War in the Pacific: Triumph in the Philippines*, (1963, repr., Washington, D.C.: Center of Military History, United States Army, 2005), 30.

[303] United States Army, *FM 5-5: Engineer Field Manual: Troops and Operations*, (Washington, DC: United States War Department, 1941), 71.

Engineer reconnaissance doctrinal progression between 1943 and 1945 is challenging to qualify. The Army engineer's foundational publication, *FM 5-5*, the War Department, and branch most recently updated this manual in 1943, which coincided with CARTWHEEL's execution and would have been the current doctrine at the time of the return to the Philippines in 1944-45. Observers and military professionals who penned accounts and assessments of their Pacific War experience insisted that lessons learned from SWPA operations were explicitly beneficial to subsequent operations within that theater.[304] The implication is that these lessons may apply to future conflicts or operations in a similar physical setting and against a comparable enemy to the Imperial Japanese Army. Furthermore, these authors surmised that any tactical planning and execution progression between CARTWHEEL and the Luzon operations would have resulted from maturing proficiency rather than alterations of branch-specific responsibilities.

Engineer reconnaissance before and during CARTWHEEL naturally focused on how the engineers could support the combat units' maneuver to and engagement of Japanese emplacements. This aligned with the Army's basic concept of the branch's elementary conception of tactical aid to the whole force assigned to a particular operation.[305] The particular support means and methods are reliant upon the "nature of the terrain, the climate, the resources and development of the theater of operations, and the character of enemy activity."[306] The engineers in evaluating the projected areas of operation also had to determine the suitability of locations for

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[304] Major John T. Collier, "Development of Tactical Doctrine for Employment of Amphibian Tanks," *Military Review* XXV, no. 7, (October 1945), 52.

[305] United States Army, *FM 5-35: Engineer Field Manual: Reference Data* (Washington, DC: United States War Department, 1941), 1.

[306] Ibid.

intended airfields or ones presently under the operational control of the Japanese.[307] Concerning the Japanese, their geographic positioning was critical information, but for the engineers, the characteristics of any obstacles and fighting positions mattered most.[308] Illustrating the escalated role of the engineers within the SWPA operational hierarchy, much of the initial CARTWHEEL reconnoitering was conducted solely by engineer officers and enlisted soldiers.[309]

Luzon represented a different context from an engineer information perspective in specific criteria. As the Philippines had been an American possession before the war, the Army had first-hand knowledge of topography, at least generally. What US commanders required in immediacy was the information associated with Japanese defenses. They still needed information on existing roads, bridges, and airfields to finalize detailed tactical plans. The Japanese had occupied the island and Manila for approximately three years when Gen. MacArthur's legions returned.

Engineer reconnaissance as an element of operational or tactical planning served SWPA leaders well during CARTHWHEEL by helping to usher in the non-doctrinal operational means of island hopping. This operational concept, practiced in the SWPA theater, required significant information across all military considerations. But engineer-specific information was critical with the overarching CARTWHEEL objectives being airfields, seaports, bases, and the infrastructure to maintain operations, such as roads and defensive fieldworks. Therefore, it should be familiar to the researcher or student of the war in the Southwest Pacific that GHQ,

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[307] Dod, *United States Army in World War II: The Technical Services: The Corps of Engineers: The War Against Japan*, (1966, repr., Washington, D.C.: Center of Military History, United States Army, 1987), 230.

[308] United States Army, *FM 5-5: Engineer Field Manual: Troops and Operations*, (Washington, DC: United States War Department, 1941), 269.

[309] Dod, *United States Army in World War II: The Technical Services: The Corps of Engineers: The War Against Japan*, (1966, repr., Washington, D.C.: Center of Military History, United States Army, 1987), 230.

SWPA, or Sixth Army HQ consistently incorporated engineers into pre-execution reconnaissance missions or, in some instances, the sole members of a particular reconnaissance team.[310] Information collected during these missions helped confirm preconceived intentions of where to place airfields without existing or eliminated proposed locations to replace sites more favorable to stated needs.[311] Exemplifying this consideration was CARTWHEEL's opening phase, consisting of the seizure of the islands of Woodlark and Kiriwina where engineer reconnaissance revealed not only topographical information related to airfields, operational bases, and roadway routes but also the absence of Japanese formations. This allowed Lt. Gen. Krueger's Sixth Army planners to organize their invasion formations accordingly. It also allowed them to structure a movement plan that ensured the most expeditious delivery of engineer units and equipment to initiate construction operations.[312]

The joint and combined arms nature of island-hopping represented a pragmatic reaction to the geography of the theater and logistical realities of 1943 more than doctrinal application, at least as a holistic concept. It also relied very heavily on voracious and explicit information. Details are inherently necessary to process military or naval information into intelligence that commanders and their planners may apply to operational planning. However, the scarcity of resources in the SWPA and amphibious complexities associated with movement inherent to CARTHWHEEL heightened the inherent need for accuracy and timeliness. The historian should consider the importance of this from the engineers' and respective task force commanders'

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[310] Major General Hugh Casey, *Engineers of the Southwest Pacific 1941-45, Volume VIII*: *Critique*, Reports of Operations United States Army Forces in the Far East, Southwest Pacific Area, Army Forces Pacific, 1950, 91.

[311] Miller, *United States Army in World War II: The War in the Pacific: CARTWHEEL: The Reduction of Rabaul,* (1959, repr., Washington, D.C.: Center of Military History, United States Army, 1995), 49.

[312] Ibid, 55.

perspectives that with insufficient information, they may emplace the incorrect "type" of engineers (and therefore equipment and capabilities) at the wrong or most inopportune time and place. Acknowledging how complex amphibious operations in the SWPA were, the reader may surmise how utterly fruitless the effort would have been to attempt to reverse such an operation. Within CARTWHEEL, an operation comprised entirely of sequential amphibious attacks, such blundering would have had a domino effect.

However, engineer reconnaissance in a doctrinal sense had tactical applications within the SWPA and not simply operational planning. The performance of engineer reconnaissance in Luzon during the advance from Lingayen throughout the island including the battle for and seizure of Manila demonstrates this. For example, intelligence gathered about Pasiga River crossing sites by reconnaissance elements in front of the 33d Infantry Division resulted in alterations to the tactical crossing plans. Scrutiny of the 1941 and 1943 iterations of the engineers' foundational doctrine, *Field Manual (FM) 5-5* does not reveal principled alterations. That should not be illuminating as both manuals outline what elements reconnaissance was to collect from the engineer's perspective. One noticeable and notable difference between these manuals is that the 1943 edition constantly refers to and emphasizes the need for reconnaissance training for those conducting it.[313]

As a military manual and therefore doctrine is the point of this observation, it is or should be self-evident that the Army would emphasize training. However, when examined against the context of Coll, Keith, and Rosenthal's summation that the zenith of engineer training and education was in mid-1943 the reader can ascertain a correlation for this shift in doctrinal

[313] United States Army, *FM 5-5: Engineer Field Manual: Troops and Operations*, (Washington, DC: United States War Department, 1943).

emphasis.[314] This subtle yet not insignificant grammatical and structural alteration between the 1941 and 1943 editions also illustrates a discernable difference between CARTWHEEL and Luzon's doctrinal reconnaissance activities.

To be clear, there existed tactical realities requiring revised engineer estimates based on ever-changing conditions throughout CARTWHEEL. The supposition is that the island-hopping design of operations rendered most of the necessary engineer intelligence associated with higher-level strategic requirements. With some notable exceptions associated with more intense combat operations along the New Guinea coast, western New Britain, and the Solomons Islands archipelago. CARTWHEEL by both incidental and intentional operational means, resulted in by-passing and isolating Japanese strong points either on New Guinea's northern coast or at various islands throughout the Bismarck Sea region. Reconnaissance training before 1942-43 naturally considered all elements and aspects of necessary engineer information, but as Coll, Keith, and Rosenthal point out, training before and immediately following the outbreak of war focused upon the more technical aspects of the engineer's scope of responsibilities.[315] With the emergence of new technologies that made the US Army a more mobile force, the emphasis on reconnaissance and resulting intelligence that enabled and ensured this mobility had to correspondingly increase within the engineer program of training. Therefore, by 1945 and the Sixth and eventually Eighth Armies operations in Luzon, the researcher finds a correlating elevation in the emphasis on the combat aspect of reconnaissance and training emphasis in *FM 5-5*.

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[314] Coll, Keith, and Rosenthal, *United States Army in World War II: The Technical Services: The Corps of Engineers: Troops and Equipment*, (1958; repr., Washington, D.C.: Center of Military History, United States Army, 2002), 573.

[315] Ibid, 155.

The doctrinal element most impacted during the war, emanating from the Army's and engineer branch's operational experiences, was that of organization, command, and control. The imposition of the altogether new amphibious responsibility and the broad variance in combat circumstances revealed to senior leaders a need to modify pre-war doctrinal suppositions associated with organization and command. Comparison of CARTWHEEL and the invasion of Luzon and the campaign to wrest it from Japan's clutches offer some curious vignettes. There were many organizational alterations, additions, or whole unit deductions associated with the engineers. The most relevant engineer formation associated with this study was that of the Group Headquarters.[316] The chronicle for such refashioning is a tedious tale charged mostly with the trappings of bureaucracy and not germane to this project. Simply conveyed, Army Ground Forces (AGF) and Chief of Staff, General Marshall determined between 1942 and 1943 that the previously proposed Army end strength believed necessary for fighting the world war was not necessary. Thus, reducing the number of combat divisions, but there remained a command and control need for those now "non-divisional" engineer battalions and separate companies during combat operations and training.[317]

Engineer command and control of these two operations examined through the doctrinal perspective reflects doctrinal alterations and varying operational contexts between the respective missions. Structurally, CARTWHEEL's multitude of operations was smaller in scale than that which transpired in Luzon. That by itself is unremarkable as Luzon (or ELKTON its operational designation) was the largest campaign planned and executed by MacArthur's headquarters staff

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[316] Ibid, 225.

[317] Headquarters, Army Ground Forces, Office of the Commanding General. *Report of Activities, Army Ground Forces, World War II*, (Washington, D.C.: US Government Printing Office, 1946), 42.

and subordinate commanders.[318] By the campaign's end, the US Army had devoted ten divisions and five separate regiments to the defeat of Japanese forces on the island. For comparison, this magnitude of involvement on behalf of the Army was larger than the formations utilized in North Africa, Italy, and Southern France.[319] These organizational contrasts between CARTWHEEL and Luzon missions not only mirror the progression of Army and engineer doctrine during the war but also reflect the pragmatic considerations for the span of command and control. The Army's principal operations doctrine at the onset of World War II, *FM 100-5* conveys that a fundamental element or characteristic of functional command and control is timeliness for order and guidance from higher to subordinate commands and therefore affording the latter more than sufficient "freedom of action."[320] Inherent to this consideration yet not expressed is the need for communication. And in an expedited fashion. For each succeeding level of command, that individual as operational area conditions change, as they persistently do, being able to effectively communicate and affect operations are critical to achieving the senior commander's mission statement and vision. The wider the span of control, both in terms of the number of units engaged and in the expansive geography of the SWPA, the higher the odds of success escalated.

In executing the overall command of CARTWHEEL's thirteen underlying operations, Lt. Gen. Krueger, because of necessity, had to do so in a decentralized fashion. Organizationally, the Sixth Army utilized the doctrinal form of a task force or combat team, a temporary formation

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[318] Dale Andradé, *Luzon: The U.S (United States). Army Campaigns of World War II* (Washington, D.C.: The U.S. Army Center of Military History, United States Army, 1995), 8-9.

[319] Ibid.

[320] United States Army, *FM 100-5: Field Service Regulations: Operations*, (Washington, DC: United States War Department, 1941), 29.

best suited to meet the understood operational environment of each of the thirteen invasions.[321] Considering the engineers as an integral part of each task force, Sixth Army planners and the army's engineer determined which "type" of engineer capability the Sixth Army must incorporate to achieve the respective desired outcome. CARTWHEEL, due to its island-hopping methodology, required significant amphibious capability and associated resources. Therefore, the respective combat team commanders had to perform another doctrinal element of command and control which was coordination and cooperation horizontally.[322] The amphibious "phase" of each CARTWHEEL operation was the tactical responsibility of MacArthur's Seventh Fleet or in the case of the Solomons portion of the operation, Adm. William F. Halsey's South Pacific command. Tactical command and control of the task force in pursuit of its stated objective(s) passed to that task force commander once ashore. The utilization of temporary, mission-specific task forces, including engineer capability was elementary to meet conditions, not necessarily as expected by planners, but more importantly with the inherent flexibility for that commander on the ground to effectively revise operational plans as warranted. For the engineers, this meant that in some instances, support (construction) units found themselves incorporated into the initial or assault landing phases of a given operation.[323]

Conversely, the 1943 implementation of the Engineer Group (Combat) headquarters initially helped Lt. Gen. Krueger and later Lt. Gen. Eichelberger exercise a more flexible and less obvious de-centralized means of command and control during combat throughout Luzon. Without this doctrinal adaptation, those engineer battalions, or separate companies of the Sixth or

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[321] Ibid, 3-4.

[322] Ibid, 22.

[323] Dod, *United States Army in World War II: The Technical Services: The Corps of Engineers: The War Against Japan*, (1966, repr., Washington, D.C.: Center of Military History, United States Army, 1987), 244.

Eighth Army would have had to attach to a subordinate division for command and control. While those divisional commanders receiving such an annex would have welcomed this, such an administrative action would have had detrimental operational effects on the corps and army commanders. As the US Army fought its way across the width and breadth of Luzon, it encountered obstacles and situations requiring a particular engineer capability or additional units to enable maneuverability and retain tactical momentum. If Sixth or Eighth Armies commanders had attached these units to one of their down-trace divisions, the corps or army commander would have less ability to respond appropriately and promptly. That is, delivering the applicable tool at the appropriate place, and at the required time. The Engineer Group (Combat) headquarters, as outlined in the 1943 version of *FM 5-5* rectified this War Department command-and-control concern, at least theoretically, by placing under the army or corps commander this engineer headquarters to dispense their assigned units as needed.[324] This proved to be an essential means of command and control as the Japanese defensive strategy in Luzon was the establishment of succeeding defensive positions that utilized the most opportune terrain features as part of their comprehensive obstacle plans.[325] A combat environment that played to the US Army engineers' roles.

Combat and support operations all over Luzon demonstrated, at least in this context, the functional merit of the Engineer Group Headquarters concept. For example, during operations within the immediate vicinity of Lingayen Gulf and on the heels of the amphibious landings, the engineers repaired or constructed 35 "major" bridges while also repairing and maintaining 550

[324] Major General Hugh Casey, *Engineers of the Southwest Pacific 1941-45, Volume VIII*: *Critique*, Reports of Operations United States Army Forces in the Far East, Southwest Pacific Area, Army Forces Pacific, 1950, 294-5.

[325] Ibid, 274.

miles of road surfaces.[326] This engineer achievement was possible because this doctrinal structure allowed divisional engineers to proceed forward with their organic parental divisions to maintain initiative and momentum. Thus, engineer actions that the divisional engineer battalions had not completed but were necessary to sustain operations, and the lines of communication (and supply) the engineer units of these engineer headquarters entities assumed responsibility for accomplishing. To further emphasize the operational and strategic engineer contribution to strategic success in Luzon, within the XIV Corps sector alone, John McManus noted that the engineers "…encountered 217 destroyed timber bridges, of which they repaired 138 and completely rebuilt another seventy-nine. Over wider rivers and streams, Griswold's (XIV Corps Commander), engineers constructed 26 Bailey bridges, ten steel treadway bridges, and fourteen pontoon bridges. They also rebuilt roads that had degraded during the Japanese occupation."[327]

Operations in Luzon and throughout the Philippines warrant greater attention from historians and researchers. While not directly equitable to the scale of OVERLORD marking the Western Allies' return to France, the Luzon invasion represented the largest land operation of the war against Japan. The former has been and continues to be exhaustively analyzed in historiography by historians while these same scholars have afforded the latter scant similar examination. This truly is fertile ground awaiting authors to churn with the plow of historical scrutiny.

While the seizure of airfields and ancillary facilities were tactical objectives of the Luzon operation, they were not as high on the prioritization list as during CARTWHEEL. That said, a larger or broader doctrinal element associated with the aerial component of war permeated

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[326] Ibid.

[327] John C. McManus, *To the End of the Earth: The US Army and the Downfall of Japan, 1945* (New York: Caliber, 2023), 27.

SWPA missions throughout the war. From a strategic perspective, the expanded utilization of aircraft had a profound impact on World War II, yet another aspect that places it in a unique historical position in sum. For the SWPA, the warplane and the operational implications associated with its use were the foundational strategic elements in mission planning and execution.[328] Air supremacy and the control of airfields were highly valuable objectives throughout the war.[329] This had an ancillary effect on the US Army's engineers by elevating their doctrinal role and importance in this most austere theater of the war.[330] Engineers were the connective tissue between the combat units responsible for fighting the Japanese and seizing key geography. It then was the engineers' task to construct new airfields on these recently secured objectives or improve existing ones wrested from the enemy.

This innovative military technological progression belied the isolated, backwater setting of the region. The SWPA's circumstances did not in and of themselves result in broad, universal alterations to the foundational tenets of US Army combat engineer doctrine. Or construction engineer doctrine for that matter. The features of engineer doctrine that did evolve was the maturing operational relationship between the engineers and what was at that time, the aviation arm of the US Army. This mirrored the birth and maturation of the engineers' amphibious component that the SWPA's geography and MacArthur's operational needs concerning strategic aims likewise spurred during the war. The reality of the juvenile but a maturing aerial component of the US military and naval war-making machine, the US War Department elucidates by its own

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[328] Captain (Polish Navy) J.G., "Armed Forces of the Future," Translated from Polish at U.S. Army Command and General Staff School and published in *Military Review* XXV, no. 4, (July 1945), 100.

[329] Williamson Murray and Allan R. Millett, *A War to Be Won: Fighting the Second World War*, (Cambridge, MA: The Belknap Press of Harvard University Press, 2000), 204.

[330] Ibid, 200.

volition. In the 1944 edition of the *War Department Technical Manual, TM 5-255: Aviation Engineers* explicitly notes that theater situations and operational requirements drive or significantly influence operational structures.[331] War Department authors postulated that basic engineer functions and activities, primarily those associated with construction in support of aerial operations, the unique characteristics of an area of operations would not affect.[332]

War in 1942-45 at its most basic required a victorious army or nation-state to get the strategic upper hand over its adversaries for victory. The seismic advancements in military technology that World War II introduced represented this in Europe and the Pacific despite the maritime nature of the latter. That the Americans, Australians, and their associates intended to win the war by invading the Japanese home islands substantiates this view of war's nature.[333] What this demonstrates for the engineers and theater commanders is that while airfields existed as principal or ancillary operational objectives, their seizure was to provide the necessary air cover for subsequent amphibious and land operations. This points to the wartime evolution of the US military and naval doctrine. Specifically combined and joint operations as the US sought to attain the requisite domination on land within a region devoid, save the exceptions of New Guinea, Australia, and the Philippines Archipelago, of substantial land masses. As the US Army's topographical experts, the engineers' position within the service's hierarchy correspondingly increased with the critical status of each isolated South Pacific Island.

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[331] United States Army, *TM 5-255: War Department Technical Manual: Aviation Engineers*, (Washington, DC: United States War Department, 1944), 5.

[332] Ibid.

[333] Staff of General Douglas MacArthur. *Reports of General MacArthur: The Campaigns of MacArthur in the Pacific,* vol. 1. (Washington, DC: Office of the Chief of Military History, Department of the Army, 1950), 395.

The degree to which US Army engineer doctrine did or did not evolve between December 1941 and August 1945 was in the end associated with the performance of the Army's engineer soldiers and leadership. Doctrine as noted previously is not an exhaustive and definitive instruction manual for how to conduct operations. It is the accord of what the Army and each of its component branches must focus on and achieve if the Army is to combat and defeat its enemies. For the engineers that charter was to provide the Army with construction support in each theater of operations, impede or deny the enemy's ability to move throughout the battlespace, and enable friendly maneuverability to attain a favorable position about the enemy and defeat it.[334] But as war is a human endeavor, like all other endeavors, the human element proved decisive.

The discussion of doctrine in historiography lends itself to the over-examination of tactical techniques and the military implements used in their execution. What chroniclers have overlooked and do today is overlook or omit the intersection between doctrine and leadership. The Army has long understood the necessary operational ingredient of the efficient and strong battlefield leader. The analyst can present the argument that this is one reason doctrine is broad and accounts for what, for this inquiry, the engineers must do as part of the wider Army team. Because doctrine cannot account for every eventuality and in every context, it provides the scientific base and allows leaders in time and space to provide the art. In the case of the US Army engineers in the SWPA, that art was to determine the most opportune means to establish the scientific outcome as dictated in the various doctrinal publications.

This work has noted throughout that the SWPA was not the US principal strategic theater of World War II. Subsequent chapters will reinforce this point as the SWPA's position in the

[334] United States Army, *FM 5-5: Engineer Field Manual: Troops and Operations*, (Washington, DC: United States War Department, 1941), 1.

broader war strategy impacted operational plans and tactical applications. This reality impacted the engineers' tactical applications during CARTWHEEL and the Sixth and Eighth Armies' invasion of and advance throughout Luzon. The ingenuity of engineer soldiers and leaders sealed that vacuum repeatedly brought on by the persistent reality of insufficient tools and materials. The most prominent example of this the reader will find is with the combat engineers supporting the advance from Lingayen Gulf to Manila during operations on Luzon in early 1945. Since the Army charged the engineers with mobility and maneuverability assurance of its formations and in Luzon water or gap crossings represented a hindrance, the engineers needed to bridge those gaps effectively and efficiently. But even with the US's mammoth industrial output by 1945, to fully supply and outfit a worldwide war was impractical. Operating without sufficient quantities of construction materials and temporary bridging components, SWPA engineers still managed to allow infantry and armored units to maintain the operational momentum.[335] The engineers accomplished this by utilizing materials procured locally, repurposing components of destroyed bridges, and pontoons, or leap-frogging temporary bridges as practical.[336] That the engineers and the US Army in the SWPA received the supplies, tools, and munitions in the amounts they did is remarkable considering the lines of supply and communications between the US continent and SWPA were among the longest in military history.[337]

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[335] Smith, *U.S. Army in World War II: The War in the Pacific: Triumph in the Philippines*, (1963, repr., Washington, D.C.: Center of Military History, United States Army, 2005), 129-30.

[336] Ibid.

[337] Staff of General Douglas MacArthur. *Reports of General MacArthur: The Campaigns of MacArthur in the Pacific,* vol. 1. (Washington, DC: Office of the Chief of Military History, Department of the Army, 1950), 40.

The Army had long held that each soldier regardless of one's occupational specialty is fundamentally an infantryman.[338] The US Army's engineers assigned to the SWPA theater of operations experienced this reality consistently. The Army may have derived a doctrine to delineate the lines of responsibility across the spectrum of military operations, but the US Army has one mission, to engage the enemy in ground combat, regardless of the circumstances in question. Throughout the operations comprising CARTWHEEL the tactical realities combined with the need to expedite construction operations resulted in the application of combat engineer formations in combat operations.[339] While operational needs were the overriding determinate for this, the SWPA theater was short of engineer units assigned contributed to such task force organization.

The tactical realities of the SWPA and the resultant engineer applications throughout the theater and as explicitly demonstrated in the respective CARTHWHEEL and Luzon operations demonstrate how US Army engineer doctrine in World War II expressed this time and place. MacArthur, in keeping with his directive from the Joint Chiefs of Staff, christened the CARTWHEEL operations for the reduction of the Japanese primary South Pacific garrison of Rabaul and the Japanese, for intent and purpose, ejected from the region. The Philippines always represented MacArthur's and thereby the US's ultimate strategic objective in the SWPA. Luzon, as the principal island because it was the largest and contained the capital city of Manila, represented the culminating step in the archipelago's recapture. There were at least four considerations associated with the respective missions: 1) achieve aerial superiority 2)

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[338] United States Army, *FM 21-105: Basic Field Manual: Engineer Soldier's Handbook*, (Washington, DC: United States War Department, 1943), 137.

[339] Dod, *United States Army in World War II: The Technical Services: The Corps of Engineers: The War Against Japan*, (1966, repr., Washington, D.C.: Center of Military History, United States Army, 1987), 244.

amphibious operations 3) state of infrastructure (lack thereof) on each respective island or land mass and 4) enemy situation. Engineer operations and considerations, to varying degrees connected all these operational concerns.

The foundational elements of engineer doctrine, are to a) enable friendly unit movement, b) restrict enemy freedom of movement, and c) construct facilities that support friendly soldiers, which the Army determined the branch must do for it and the Army to be successful, did not alter during the war.[340] That is not to surmise that tactics, techniques, and procedures associated with those foundational elements themselves did not have to adapt as battlefield experiences either validated or disproved prewar suppositions. The CARTWHEEL conglomerate of operations in 1943 and the later Luzon invasion and advances of 1945 offer reasonable vignettes to contrast and compare Army engineer doctrine in specific components by which to consider doctrinal evolution. From the SWPA perspective, the obvious doctrinal elements open to scrutiny are those of amphibious and aerial operational support.

Both represented evolving components of US Army military operations as before World War II and neither were available in a practical, wide-scale sense. With amphibious operations, the US Army aside from river crossings in its history had not experienced the operational need for maneuvering units and equipment over large bodies of water for campaigning. That of course changed with World War II and in the SWPA especially. In the SWPA, water served as the tangible axe of advancement throughout the theater, and in the urgency of response, the engineers offered the most sensible branch to take ownership of this task. But beyond the simplified view of moving the Army from naval transports to the shore, there were correlating

[340] United States Army, *FM 5-5: Engineer Field Manual: Troops and Operations*, (Washington, DC: United States War Department, 1941), 1.

actions required on preparing and securing landing areas and then the pathways and roads off them to carry the fight to the Japanese. All of which required new and innovative doctrinal elements to execute. But in the end, while this all represented adaptive doctrinal elements, it remained a means by which to fulfill the engineer's foundational tenet of enabling US Army mobility and maneuverability. That way, in the end, it simply represented an adaptation of existing doctrine.

Likewise, the incorporation of engineers supports the emergence of air power as a martial operational element. Another pragmatic implementation associated with the geographic realities of the SWPA, support of air operations necessitated a significant engineer role. The various islands of the SWPA region represented unsinkable but immobile carriers by which to support the advance towards Japan proper. World War II became the first war in history where aerial supremacy became an essential element of ground combat operations. The US Navy could not support every amphibious operation across the breadth and depth of the Pacific War area and thus these islands became necessary, if for no other reason, than for the establishment of airfields and supporting infrastructure to support air operations. In the SWPA, often, the establishment of these airfields had to occur from scratch. In other instances, the objective of the operation was to seize an existing airfield established by the occupying Japanese. Either way, engineer support was necessary. From a doctrinal perspective, engineers in conjunction with the authorities from aerial operations-charted elements heretofore unnecessary in previous US wars. But again, this emerging requirement did not itself represent an altogether new doctrinal requirement from the engineer perspective, but an element of foundational engineer doctrine, that of construction in support of operations, and this too the researcher could argue represented a means of facilitating friendly mobility within the battlespace.

As the US Army's topographical experts, it has traditionally been the engineers' responsibility to assist with reconnaissance missions to ascertain geographical characteristics associated with an area of operations and enemy obstacles and engineer activities. This of course represented a significant task for the engineers who found themselves in the SWPA. While historians may not ascertain any doctrinal evolution associated with reconnaissance in its elementary format, they can deduce that alterations associated with how the Army trained individual engineer soldiers to conduct reconnaissance and its emphasis before overseas deployment did occur between 1943 and 1945. Reconnaissance was how leaders throughout the chain of command in the SWPA obtained intelligence associated with proposed areas of operation and then determined both task force composition and to varying degrees tactical plans by which to achieve desired results. The resulting information required sharing with subordinate engineer commanders to afford them the latitude to execute leadership on the battlefield and devoid of top-down dictated methodology not germane to the situation. The Army, in the early months and years of the war, surmised soldiers and engineer soldiers specifically, had not adequately prepared or emphasized this foundational element of engineer operations. This is astounding considering the critical nature of engineer intelligence within the larger pantheon of operations.

The SWPA may not have led to revolutions in the basic principles of US Army engineer doctrine. Through battlefield experience, it offered insight into elements of foundational doctrine that the engineer branch could refine, discard, develop, or validate. What operations in this theater demonstrated or codified was that despite the imposition of advanced technologies, it remained for human activity, ingenuity, and leadership to achieve results. Doctrine, whether it be the engineers, infantry, or logisticians could only present the overarching requirements of the

branch or arm. It could not provide a step-by-step process that soldiers and unit leaders only need to follow in the performance of their tactical responsibilities. Engineer doctrine, to what degree and in what elements it did evolve during the Pacific War, did so predominately as the output representing the product of US victory more so than the engine by which the Army attained victory.

Chapter VI:

SWPA US Army Combat Engineers

A fundamental tactical responsibility for the US Army's combat engineers during World War II was to establish battlefield physical conditions that allowed for the unhindered maneuver of the infantry, armor, and corresponding friendly units.[341] This engineer obligation of ensuring freedom of mobility to their respective combatant commanders and formations has existed since the onset of and throughout military history and remains a benchmark engineer tenet to this day. For the combat engineers who found themselves in the Southwest Pacific, the harsh and rugged topographical realities of that theater imposed upon them a tactical experience that was much more exacting than their engineer brethren encountered in the Mediterranean and Western European theaters. The Army's SWPA combat engineers, in ensuring battlespace portability, exacted the fullest possible extent of their broad military skills both as engineers and, as necessary, infantry soldiers.

The historiography of the SWPA's combat engineers serves as a euphemism for the larger US Army units and soldiers of this theater of operations. There is a sense of irony associated with this oversight associated with the Army's prewar plans and concepts. As noted elsewhere within the body of this work, the US Army believed that its next war, with Nazi Germany, would be one of the advanced technologies, fought in a climate conducive to the application of these state-of-the-art munitions.[342] That proved to be an accurate prognostication, but only in an elementary sense. What the US strategic planners did not entirely develop was a comprehensive strategy for

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[341] United States Army, *FM 5-5: Engineer Field Manual: Troops and Operations*, (Washington, DC: United States War Department, 1941), 1.

[342] Blanche D. Coll, Jean E. Keith, and Herbert H. Rosenthal, *The United States Army in World War II: The Technical Services: The Corps of Engineers: Troops and Equipment*, (1958; repr. Washington, D.C.: Center of Military History, The United States Army, 2002), 19.

the planning and execution of combat operations in every imaginable physical setting, against enemies not equitable to Germany in the most current tactical doctrine and weapons systems. This was the reality of the Pacific War with Japan.

Therefore, this war from the US Army perspective has been much more difficult to qualify and analyze as it in many elements represented a non-doctrinal existential conflict. Well-defined roles and responsibilities as stipulated in the doctrinal field and technical manuals, were not so clearly discernable in the austere islands of the Pacific, thousands of miles away from the US mainland. Islands, devoid of the presumed infrastructure and topography amiable to the implementation of modern equipment, especially wheeled and tracked vehicles. Combined with the SWPA's army units standing on the prioritization list, reality necessitated planners, leaders, and commanders improvise to achieve the stated intent of the nation's civic leadership and Gen. MacArthur in the person of SWPA theater commander. While all this is an accurate, albeit broad, assessment of the Pacific War and its unique position within American military historiography. But these trials did not absolve the Army or its combat engineers of their doctrinal responsibilities; instead, they propelled engineer accommodation to meet the certainty of the time and place they found themselves in.

Therefore, despite the war that the US Army believed it would fight between 1939 and 1941, circumstances changed in the aftermath of Japanese raids and attacks in December 1941. The series of operations throughout 1943 that comprised CARTWHEEL aimed to eliminate Japan's primary South Pacific base located at Rabaul on the island of New Britain. As Gen. MacArthur's first SWPA large-scale offensive, CARTWHEEL is a splendid perspective from which to analyze the combat engineers' unique experience in this portion of World War II. Besides CARTWHEEL, the bookend grand-scale offensive was MacArthur's return to the

Philippine principal island of Luzon in 1945. These Pacific War offensives demonstrate the essential role of the combat engineer in mid-twentieth-century warfare, the most technologically advanced means of conflict in the annals of military history. Major General (Maj. Gen.) E. Reybold, Chief of US Army engineers in the early months of the US participation in the war, noted that the advanced industrial nature of warfare by this time placed mobility at the center of martial offensive methodology and therefore elevated the combat engineers' contribution.[343] The contrast between these missions lies with the geographical and resource realities that influenced how the engineers went about providing mobility to the combat formations. As assessed in the previous chapter, Army doctrine contributed to these soldiers' means and methods, but represented only one element and could not account for the entirety of the combat engineer experience of the SWPA operational theater during World War II.

The need to maneuver one's formations and soldiers into a location more favorable to the enemy may appear obvious and therefore not worth substantial consideration. Clausewitz prostrating that the defense was the stronger and easier form of warfare, it was also less decisive.[344] The attack, Clausewitz argued, while more difficult to execute was the form of war by which one army attains decisive results over its enemy.[345] The attack or offense he surmised consisted of three decisive elements: a) surprise, b) terrain advantages, and c) massing of

[343] Major General E. Reybold, "Forward," to Paul W. Thompson, *Engineers in Battle*, (Harrisburg, PA: The Military Service Publishing Company, 1942).

[344] Carl Von Clausewitz, *On War*, ed. and trans. Michael Howard and Peter Paret (Princeton: Princeton University Press, 1976), 358.

[345] Ibid, 360

attacking forces. [346] All three of these elements are associated with the ability of a commander to maneuver within battlespace, to occupy that position of relative superiority.

Knowing that the question remained for MacArthur and his downtrace commanders, how did this tactical mobility apply to isolated island outposts scattered throughout the SWPA theater of operations, and then, how could they achieve it? The doctrinal focus and empirical argument for this work's thesis topic has rested unilaterally with the US Army engineers. However, the combat engineers assigned to CARTWHEEL and Luzon operations needed to have a functional understanding of basic infantry and armored force tactical doctrine as it relates to mobility to adequately support each.

The ability of a military formation to achieve a physical position that is more advantageous than its enemy is foundational to the art and science of war. The delicate balance of concern for the US Army between the World Wars was mobility concerning firepower.[347] That reality implied that the Army's engineers were going to have an inherent and significant role, especially when analyzed through the lens of the Southwest Pacific Theater. The researcher must also be cognizant of the American doctrinal idea of what Russell Weigley defined as the "direct application of power."[348] In plain language, this stratagem meant directly confronting an enemy with overwhelming force instead of fighting less virulent engagements on the periphery. Whether intentional or not, and the latter appears to have been the prevailing attitude among infantry officers especially, the element of mobility for a twentieth century, technologically structured

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[346] Ibid.

[347] John B. Wilson, "Mobility Versus Firepower: The Post World War I Infantry Division," *Parameters* XII, no. 3 (September 1, 1983), 47.

[348] Russell F. Weigley, "Shaping the American Army of World War II: Mobility Versus Power," *Parameters* XI, no. 3 (September 1, 1981), 16.

military, required engineer incorporation. The SWPA demonstrated this in that it was an underdeveloped region of the world, lacking the infrastructure necessary to utilize newer innovations such as tanks, or even to facilitate the movement of infantry formations on foot.

Since land operations in the SWPA occurred primarily on widely dispersed and sometimes isolated islands or chains of islands, mobility in this operational theater characterized the favored American operational design of direct assault. In the case of this war, amphibious assault followed by maneuvering through dense jungle growth and the absence of roads. Tactically there simply existed few, outside of Luzon, scenarios in which engineers were not inherently necessary. That reality unquestioned today by students and researchers of the war era in question was antithetical to many within the US Army's hierarchy preceding the war.[349]

Despite examples from Europe beginning with Germany's invasion of Poland in 1939, a group of US Army officers held to the belief that this advanced technology minimized, at best and at worst eliminated, the need for combat engineers as capability organic to combat formations. This, officers of such a mindset, would have pointed to the Army's corps-level training exercises of 1937 as largely proving their point of view based on the results of the war game. But as Blanche D. Coll, Jean E. Keith, and Herbert H. Rosenthal pointed out, the operational conditions of said exercise did not equate, in any way, to what the Army's combat engineers, and especially those in the SWPA, would experience.[350] Between the conclusion of this training event and the US entry into the war, further stunted was a program of engineer advancement associated with mobility.

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[349] Blanche D. Coll, Jean E. Keith, and Herbert H. Rosenthal, *United States Army in World War II: The Technical Services, The Corps of Engineers: Troops and Equipment,* (1958; repr., Washington, D.C.: Center of Military History, United States Army, 2002), 390.

[350] Ibid, 15.

The Army of World War II was not the Army of World War I, although many in senior leadership positions in the interwar era believed the opposite. Despite the German Army's modest scale of technological advantage in the opening of the conflict, that which they did have was extremely well employed at the tactical level. That included an enhanced role for the combat engineer as an inherent component of maneuver or combat units, not a degraded one. US Army observers and analysts of the opening period of the European conflict noted that advanced technologies in equipment and munitions did not mitigate engineer necessity (about natural, topographical obstacles or implications), but in fact, altered it.[351] What these innovative technologies resulted in was expanding a respective area of operations which elevated the odds of mobility impediment and not mitigation. For the senior and subordinate combatant commanders in the given area of concern, this reality held not only combat action implications but also supply considerations.[352] The engineers understandably in the time immediately preceding the war sought to retain their combat relevance by seeking ways to demonstrate to Lt. Gen. Leslie J. McNair, Commanding General of Army Ground Forces (AGF), that the branch could develop tactics that nested with his, McNair's, idea of modern war. That notion is that US Army combat formations must be "lean" enabling them to lightly travel (increased tempo), thus enter combat "quickly" and "successfully."[353]

Mobility as a function of military operations is not simply associated with the natural obstructions of topography and climatic conditions. Reduction of obstacles constructed or emplaced by an enemy formation defending a particular point on the ground or an area is

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[351] Major J.L. Hunter, "Tactical Study of Terrain," *Military Review* XXIII, no. 10 (January 1944),

[352] Colonel J.G. Cowley, "The Supply of a Mobile Division in Open Country," *Military Review* XXIII, no. 3 (June 1943), 21.

[353] Ibid, 574.

necessary to allow for friendly force mobility. Demolitions to reduce or destroy natural and unnatural obstacles were an integral role of combat engineers in all of World War II's theaters of operation and were especially necessary for those operating in the SWPA's dense jungle cover and complex Japanese fortifications. That an enemy formation executing a defense would not seek to restrict and impede US Army units in the attack, thereby disrupting momentum, an element of such an action, does not appear to have factored into some within the Army's notion of reducing engineer incorporation into maneuver units, appears illogical to the contemporaneous researcher. That appears even more fantastic when the historian or readers consider that the Army doctrine of the period emphasized the need for neutralizing the enemy in question's own combat engineer capability.[354]

The idea of mobility in the SWPA should not be solely associated with the utilization of technology or vehicles and tanks. combat engineer mobility support was likewise an important consideration of infantry tactical design. The incorporation of combat engineers and their obstacle-reduction capabilities into the amphibious assault force structure demonstrated the inherent value provided by engineer support. The assault of New Georgia in the opening period of Operation CARTWHEEL exemplified this reality with the combat engineers ensuring sustained mobility by eliminating fortified, man-made fighting structures and caves utilized by defending Japanese soldiers.[355] Unlike the US Army's other theaters of operation in World War II where commanders at all levels measured tactical progression by the amount of ground gained,

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[354] United States Army, *FM 5-15: Engineer Field Manual: Field Fortifications*, (Washington, DC: United States War Department, 1940), 9.

[355] Karl C. Dod, *United States Army in World War II: The Technical Services: The Corps of Engineers: The War Against Japan*, (1966, repr., Washington, D.C.: Center of Military History, United States Army, 1987), 245.

in the SWPA, time, between any set number of points or tactical objectives, was the barometer.[356] The assaults of Buna Station on New Guinea during which the combat engineers hastily constructed footbridges spanning small gaps and streams, allowing the infantry formations to maneuver around Japanese fortifications and attack from positions other than right on or frontal illustrate this.[357]

Mobility within the tactical context of the SWPA is related to the positioning of formations in its most strict sense and to the purpose of concentrating combat power. Associating this with the reality that wheeled and tracked vehicles were the primary means of maneuvering by World War II and therefore generally, but not exclusively, required roadways is yet another justification of the engineer's role in ensuring mobility. This truism applies to each echelon of Army organization and composition. Its elementary nature and association with the combat engineers were on full display during MacArthur's 1945 Luzon campaign. Lt. Gen. Walter Krueger's Sixth Army comprised the initial main effort during the campaign. Lt. Gen. Robert Eichelberger's Eighth Army followed on in the subsequent advance towards the Philippine principal and capital city of Manila. Luzon and the Philippines' actions in general present the only example of large formation operations, utilizing contemporaneous munitions to concentrate firepower in a combined arms fashion to deliver a decisive blow at a specific point.

The operations preceding the return to the Philippines such as CARTWHEEL exemplify the near-impregnable nature of jungle combat and how doctrine, and in this context specifically, that of mobility had to adapt for the US Army to be successful. Examining mobility in this

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[356] Major Jack W. Rudolph, "It's All in the Books," *Military Review* XXIII, no. 2 (May 1943), 10.

[357] Office of the Chief of Engineer, Major General Hugh Casey, *Engineers of the Southwest Pacific 1941-45, Volume I*: *Engineers in the Theater Operations*, Reports of Operations United States Army Forces in the Far East, Southwest Pacific Area, Army Forces Pacific, 1947, 90.

context then does not require positive affirmation through vignettes demonstrating the activities of combat engineers to qualify their importance to combat agility. Professional officers who served in the SWPA present the argument that the absence of such formations and thus, the mobility-ensuring capability also demonstrates their elementary placement within the combined arms hierarchy of contemporary tactical planning and application. Without combat engineer support to the combatant commander and formations, operations could at times result in delays or cancelation. Moving to contact or while in contact with the enemy is not as simple as it appears, because we humans have the dexterity to move about and thus equate that to mobility in all settings and situations.

The 1941 edition of the Army's *Field Manual (FM) 100-5: Field Service Regulations: Operations*, conveys the inherent complexities and deliberate nature of the military movement, whether tactical or not.[358] The topographical and foliage realities of the SWPA theater rendered all movements, whether by foot or vehicle a tactical operation. This aligns with yet another of Clausewitz's suppositions associated with war in its broader context and specific engagements. That being movement is itself a tactical or combat operation, aligned with the ultimate objective of a given mission.[359] Gap-crossing actions and bridging emplacement are the most obvious and discussed combat engineer element in this sense, but as previously conferred, the US Army doctrine of the era required much more from them than that well-trod aspect. Obstacle reduction, in the wide array of obstacle representations, was a combat engineer responsibility routinely exercised in the SWPA. In summation, effective troop movements were a prerequisite for the US

[358] United States Army, *FM 100-5: Field Service Regulations: Operations*, (Washington, DC: United States War Department, 1941), 75.

[359] Clausewitz, *On War*, ed. and trans. Michael Howard and Peter Paret (Princeton: Princeton University Press, 1976), 129-30.

Army's combat formations to achieve decisive (in a positive sense) combat results. This a combatant commander achieved by placing the appropriate combat elements (soldiers, equipment, and munitions) at the appropriate point and time.[360] This all required unhindered mobility, the purview of combat engineers.

For instance, during the CARTWHEEL operational period, the objective of the Maffin Strip on the northern coast of Western New Guinea offers an example of this critical combat element. For the US Army's given regimental combat teams to eventually secure the requisite airstrip, they had to first gain their intermediate objective of what was known to the US Army as Lone Tree Hill.[361] Actions on and within the immediate vicinity of the conspicuously termed "Lone Tree" Hill encapsulate the tactical difficulties of combat in the broader SWPA and the combat engineers' role in eventually capturing it.

Operations in this area were division-directed missions conducted by regimental combat teams at the tactical level. That means the only engineer capabilities and assets in the immediate Wakde-Sarmi area of operations were the combat engineer battalions organic to the respective infantry divisions comprising Task Force TORNADO. As discussed in Chapter 5 of this project, the foundational engineer doctrinal publication of the period was *FM 5-5, Engineer Field Manual: Troops and Equipment* which the War Department published twice during the war era, 1941 and 1943. In outlining the roles and responsibilities of the divisional engineer battalion (Combat), Army doctrine explicitly codified that it was to undertake all technical activities, from

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[360] *FM 100-5: Field Service Regulations: Operations*, 69.

[361] Robert Ross Smith, *United States Army in World War II: The War in the Pacific: The Approach to the Philippines*, (1953; repr., Washington, DC: Center of Military History, 1996), 244.

the engineer perspective, to perpetuate the relative combat power of its affiliated infantry division. Assured mobility being the most notable.[362]

By traditional US Army engineer doctrine, the divisional combat engineer battalions during the Wakde-Sarmi (CARTWHEEL) and Luzon operations, were piecemealed to the various combat teams and maneuvering elements of their respective divisions to provide that respective combat element commander with the most plausible and comprehensive engineer support. For the combat engineers involved in the Maffin and Lone Tree Hill actions, which did require activities across their occupational spectrum. *FM 5-5* in both its 1941 and 1943 iterations characterized divisional engineer support as immediate, temporary, or emergency.[363]

Lone Tree Hill especially demonstrates this multifaceted dexterity of the combat engineers. Lone Tree was a topographical feature, approximately 175 feet tall at the far Northern end of a line of ridges that terminated at the ocean's edge along the New Guinea coast. It sat astride Lt. Gen. Krueger's direction of advancement to the strategic objective of the Maffin airstrip.[364] Krueger's assigned formations, the TORNADO Task Force could not bypass this hill and seize the airstrip by amphibious assault due to the unavailability of landing craft.[365] The ground within the immediate vicinity of this hill and the taller ridges to its South precluded the utilization of tanks, at least in ascending the hills themselves, and the narrow pass between Lone Tree and the Southern features precluded the dispensation of them in an appropriate combat

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[362] United States Army, *FM 5-5: Engineer Field Manual: Troops and Operations*, (Washington, DC: United States War Department, 1941), 44-63, and United States Army, *FM 5-5: Engineer Field Manual: Engineer Troops*, (Washington, DC: United States War Department, 1943), 48-53.

[363] Ibid, 10 (1941 version) and 53 (1943 version).

[364] Smith, *The War in the Pacific: The Approach to the Philippines*, (1953; repr., Washington, DC: Center of Military History, 1996), 244.

[365] Ibid.

formation. Therefore, the seizure of this intermediate objective, necessary for the task force to maneuver to the Maffin airstrip, necessitated US infantry attacks to seize it by defeating the Japanese formations entrenched upon it.[366] American aspirations presumed that the attacking formations would gain control of the hill within a matter of hours. In the end, it required the better part of 32 days (about 1 month) and two divisional task forces (the elements of the 41st Infantry Division comprised the initial TORNADO Task Force, but Sixth Army Headquarters replaced them with regimental combat teams from the 6th Infantry Division in June as the former was slated for follow-on operations).[367] The onerous nature of the vegetation covering the hill combined with intricate Japanese emplacements rendered US infantry attacks difficult and elevated the necessity of the associated combat engineers.

As Brig. Gen. Jens Doe, himself a veteran of the SWPA with the 41st Infantry Division, argues in his missive that jungle warfare reconnaissance activities are critical to attacks conducted in such terrain to accurately determine enemy dispositions.[368] On Lone Tree Hill, obtaining this information and specifically engineer information associated with the character of the routes available for attacks and specifics of Japanese emplacements and obstacles were difficult and often incomplete. Throughout the fighting within the vicinity of and on Lone Tree Hill the task force commanders required the combat engineers to improve roads to facilitate the maneuverability of the attacking combat units and maintain lines of communication and

[366] Ibid.

[367] Ibid, 244-75.

[368] Brigadier General Jens A. Doe, "Notes on Jungle Warfare," *Military Review* XXIII, no. 10 (January 1944), 7.

supply.[369] This all ascribes to the engineer doctrine of the time which noted that combat engineer capabilities must be placed at or "with the advance guard or near the head of each principal column" to establish the conditions most likely to result in successful tactical completion.[370] As the US efforts to gain control of Lone Tree Hill grudgingly proceeded, the incorporation of armor support to the 6th Infantry's formations was decided upon but required the engineers to blast coral reef to facilitate this. Removal of this material was necessary so that the transports ferrying these tanks from the transport ships could land these vehicles closest to the area of operations. [371] In response to the US infantry attacks, the Japanese did not remain stationary in their defense. Throughout the operation, they undertook periodic counterattacks, such as the night of 29-30 May in which they fell upon the C Company of the 27th engineers, dug in on the hillside. In this instance, the engineers had to immediately become infantrymen and throughout the night with their individual and squad weapons systems, they eventually defeated this Japanese counterattack at the cost of five combat engineers killed in action.[372]

The TORNADO Task Force's changeover from the 41st Division to the 6th Division brought no tactical transition for the respective combat engineer units and soldiers. With the organizational rotation underway, one of the first units of the latter to move into the Lone Tree Hill area was the division's organic 6th Engineer Battalion (Combat).[373] As the task force's

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[369] Dod, *United States Army in World War II: The Technical Services: The Corps of Engineers: The War Against Japan*, (1966, repr., Washington, D.C.: Center of Military History, United States Army, 1987), 535.

[370] United States Army, *FM 100-5: Field Service Regulations: Operations*, (Washington, DC: United States War Department, 1941), 75.

[371] Smith, *The War in the Pacific: The Approach to the Philippines*, (1953; repr., Washington, DC: Center of Military History, 1996), 249.

[372] Ibid, 252.

[373] Ibid, 260.

recently arrived formations pushed ahead with the Lone Tree Hill action, they encountered the stoutness and conspicuousness of the Japanese soldiers utilizing the inherent natural strengths of the hill's topography. Most notable was their fighting from the numerous caves that littered the hillside which proved difficult to displace them from. To resolve this, the regimental combat teams' commanders called upon the 6th Battalion's engineers to fight as infantry and to simultaneously demolish these stout fighting positions.[374]

This period of laborious movement and intense combat was taxing to each US soldier engaged in this advancement toward the Maffin airstrip. From the divisional combat engineer perspective, the researcher must recall that another doctrinal requirement of US Army engineers was to construct or assist with the construction of fighting positions and emplacements that provided a relative degree of cover and concealment for the combat soldiers and units with whom they were in support of. The cycle of combat patrols, assaults, withdrawals, and digging-in would have extracted a considerable amount of time and effort from the combat engineer soldiers and formations of the TORNADO Task Force. As the US Army's "terrain experts," tactical combat leaders would have solicited from engineer leaders their advisement for emplacing their soldiers' fighting positions and weapons placement while developing a unit perimeter during halts consisting of rather prolonged periods, such as overnight.[375] An unforgiving landscape such that Lone Tree Hill represented, was tailor-made for considerable defensive tactics, especially so for the Japanese Army and soldiers who demonstrated their propensity for such and in this context. None of the primary source material or secondary

[374] Ibid, 268.

[375] United States Army, *FM 5-5: Engineer Field Manual: Troops and Operations*, (Washington, DC: United States War Department, 1941), 265.

narratives recounting this engagement on New Guinea's Northern coast explicitly discuss or analyze the reconnaissance efforts associated with Lone Tree Hill's seizure but based upon the doctrine and critical role of information gathering and processing, the researcher may presume this to have occurred to some extent.[376] To the degree that it did occur, tactical commanders on the ground and inherently responsible for organizing such missions would have incorporated the combat engineers into such activities. While the divisional combat engineers supporting the maneuvering to the Maffin airstrip did not have to devote a considerable amount of time to bridge repair, in relative consideration, it did occur on a limited basis, demonstrating yet again the broad expectations placed upon the engineers in accomplishing the mission.[377]

From the successful culmination of the CARTWHEEL operations to the US Army's largest land campaign or operation of the war with Japan in the re-taking of the Philippine Archipelago, there were no alterations to the fundamental engineer doctrine and its relation to the support required of the branch with its association to the primary combat arms of infantry and the armored force. Assurance of mobility represented by the respective combatant commanders' freedom to maneuver their formations across the battlefield or battle space remained the combat engineers' operational focus. However, unlike the physical realities of New Guinea that necessitated movement and combat primarily by foot, the topography of the Philippines and the island of Luzon especially, afforded the US Army the prospect to plan and execute operations in a more mobile fashion, a war of agility that it had prepared for structurally, tactically, and in

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[376] United States Army, *FM 100-5: Field Service Regulations: Operations*, (Washington, DC: United States War Department, 1941), 26-29, United States Army, *FM 5-5: Engineer Field Manual: Troops and Operations*, (Washington, DC: United States War Department, 1941), 265, United States Army, *FM 5-5: Engineer Field Manual: Engineer Troops*, (Washington, DC: United States War Department, 1943), 13, and United States Army, *FM 5-35: Engineer Field Manual: Reference Data*, (Washington, DC: United States War Department, 1941), 29-34.

[377] Dod, *United States Army in World War II: The Technical Services: The Corps of Engineers: The War Against Japan*, (1966, repr., Washington, D.C.: Center of Military History, United States Army, 1987), 535.

munitions.[378] This also meant that the combat engineers would be expected to facilitate maneuverability by bridging water crossings and other gaps that represented mobility obstructions.

The nature of combat warrants reaffirming the fact that combat engineers, especially those of the divisional engineer battalions, (or regiments for those affiliated with the infantry divisions yet organized in the outmoded square structure) were responsible for expedient construction activities. Construction activities associated with US Army engineers in the broader sense are associated with service support requirements, such as the building of structures, airfields, roads, and other large projects. Facilities from which the Army could conduct operations and administrative functions in prosecuting the war. But for the combat engineers, construction had a much narrower scope associated with this technical aspect of their military occupational skill set. Combat engineer construction was to preserve and protect the relative combat power of its organic or supported formation(s). That amounts to, again, the combat engineers assuring the mobility of said units while simultaneously having to build, temporarily, or repair means to either facilitate movement or protect soldiers and equipment.[379]

To highlight this overlooked element in the narrative and academic historiographical accounts, there are in the operational records of the campaign illustrations of how construction activities supported the strategic aims of the campaign. Lt. Gen. Krueger's operational intention

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[378] Martin K. Gordon, "The Liberation of the Philippines," in *Builders and Fighters: U.S. Army Engineers in World War II*, ed. Barry W. Fowle (Fort Belvoir, VA: Office of History, United States Army Corps of Engineers, 1992), 385. Ronald Spector notes in *Eagle Against the Sun: The American War with Japan*, (New York: Vintage Books, 1985), 518 that MacArthur intended to utilize large-scale, mobile formations on Luzon owing to its characteristics.

[379] United States Army, *FM 5-15: Engineer Field Manual: Field Fortifications*, (Washington, DC: United States War Department, 1940), 1 and United States Army, *FM 5-15: Corps of Engineers: Field Fortifications*, (Washington, DC: United States War Department, 1944), 2.

was for his two Army corps to advance from the initial assault area of the Lingayen Gulf towards Manila by way of the fertile Central Plains region.[380] This would be identical to Japanese Lt. Gen. Masaharu Homma's invasion plan of Luzon in December of 1941.[381] The Central Plains, while flat and open topography, was also traversed by many streams of various sizes which rendered it a fertile agrarian region but presented potential mobility challenges in their own right.[382] It did, however, contain a well-developed infrastructure of road networks and other transport infrastructure.[383] Krueger's Sixth Army consisted of the I and XIV Corps with the latter (37th and 40th Infantry Divisions with 108th Regimental Combat Team (RCT) as the corps reserve) as the main effort advancing on Sixth Army's right in a more direct route to Manila. I Corps, with the 43rd and 6th Infantry Divisions with the 63rd RCT as corps reserve, was to comprise the left "wing" of the Sixth Army's operation and effectively protect the XIV Corps' left flank against possible Japanese attacks emanating from the mountain ranges to the East and North.[384]

Combat engineers represented high priority and valuable targets for Japanese forces and snipers especially. Wounding or killing American combat engineers, in relative numbers of course, might have the tactical and strategic effect of impeding the US Army's ability to reduce obstacles, cross gaps (rivers, streams, etc.), repair roads, railroads, airfields, and a whole list of other considerations critical to sustaining combat operations. For example, to give life to

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[380] Staff of General Douglas MacArthur, *Reports of General MacArthur: The Campaigns of MacArthur in the Pacific,* vol. 1, (Washington, DC: Office of the Chief of Military History, Department of the Army, 1950), 262.

[381] Ibid, 6.

[382] Ibid, 262.

[383] Ibid.

[384] Ibid, 254 and 261.

Krueger's plans on paper and seize the tactical initiative following the initial landings, Sixth Army's combat engineers supported operations by clearing roads of obstacles, reducing other obstacles intended to prevent, restrict, or re-direct American movements, emplacing across streams, rivers, and other "gaps" temporary bridges, and in one instance the removal of approximately 20 miles of existing railroad track to transform the railroad bed into a roadway suitable for wheeled and tracked vehicle traffic.[385] According to the reports collected and edited by Gen. MacArthur's staff, essentially all those combat engineer efforts were performed and completed while receiving direct or indirect fire from the Japanese.[386]

Discussion and analysis of the overall operational design and tactical execution of the Luzon campaign are beyond the scope of this study, sufficient to say that while the campaign did ultimately transpire as envisioned by MacArthur from a conceptual viewpoint, in its execution, the SWPA commander reportedly, was not entirely satisfied, especially with the tempo of operations and advancement of Sixth Army.[387] As the Luzon operation matured, units beyond those initially placed ashore by the Sixth Army buttressed the campaign and in particular the advance on the Filipino capital city of Manila. The 1st Cavalry Division, a smaller and more mobile formation than the infantry (triangular) divisions, was in direct support of the XIV Corps. Ultimately Lt. Gen. Robert Eichelberger's Eighth Army joined the fray, executing amphibious landings Southwest of Manila.[388] While this altered the operational task force structure by adding

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[385] Ibid, 261.

[386] Ibid.

[387] Dale Andradé. *Luzon: 15 December 1944 – 4 July 1945: The U.S (United States). Army Campaigns of World War II* (Washington, D.C.: The U.S. Army Center of Military History, United States Army, 1993), 9.

[388] Ronald Spector, *Eagle Against the Sun: The American War with Japan*, (New York: Vintage Books, 1985), 523.

more US forces, it naturally did not alter the tactical expectations for the combat engineers. From an operational perspective, the Eighth Army's introduction was not only to increase US combat power in the race to and for Manila but also to prevent the Japanese supreme commander in the Philippines, Gen. Tomoyuki Yamashita, from withdrawing the bulk of his units and combat capabilities into the Bataan Peninsula, a region that MacArthur understood from his 1941-42 experiences, offered topography that lent itself to executing strong defensive operations and in-depth.[389]

From the moment the initial Sixth Army assault troops came ashore on the Lingayen Gulf beaches on 9 January 1945, bridging and road status considerations garnered the utmost attention for combat engineer planning and execution. John McManus recounts in his third and final Pacific War trilogy, *To the End of the Earth: The US Army and the Downfall of Japan, 1945* that Kruger ascribed the perceived overly plodding southern advance from the Lingayen region towards Manila to bridging issues. [390] It is of course effortless to note the absence of sufficient engineer soldiers and units along with bridging materials or components as retarding tactical mobility of the combat formations. That summation was the factual assessment of the situation. However, other historians and analysts might ascertain that this applies to campaigns throughout recorded military history. Regarding the Sixth Army's advance on Manila, there is another school of thought that Kruger himself was too deliberate in his operational approach. That is, he maintained too tight a reign on his corps and divisional commanders instead of pushing them at breakneck speed by MacArthur's wishes as noted by Spector and others.[391] Be accurate or not, it

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[389] Staff of General Douglas MacArthur, *Reports of General MacArthur: The Campaigns of MacArthur in the Pacific,* vol. 1, (Washington, DC: Office of the Chief of Military History, Department of the Army, 1950), 267.

[390] John C. McManus, *To the End of the Earth: The US Army and the Downfall of Japan, 1945* (New York: Caliber Books, 2023), 27.

[391] Spector, *Eagle Against the Sun: The American War with Japan*, (New York: Vintage Books, 1985), 523.

did not affect the availability of bridging elements or lack thereof. There were other ways to transport soldiers, munitions, and supplies from one side of a gap to the other, and maneuver commanders out of expediency, utilized alternatives. The most common alternative process was to utilize ferries to shuttle back and forth between the respective banks and shores.[392]

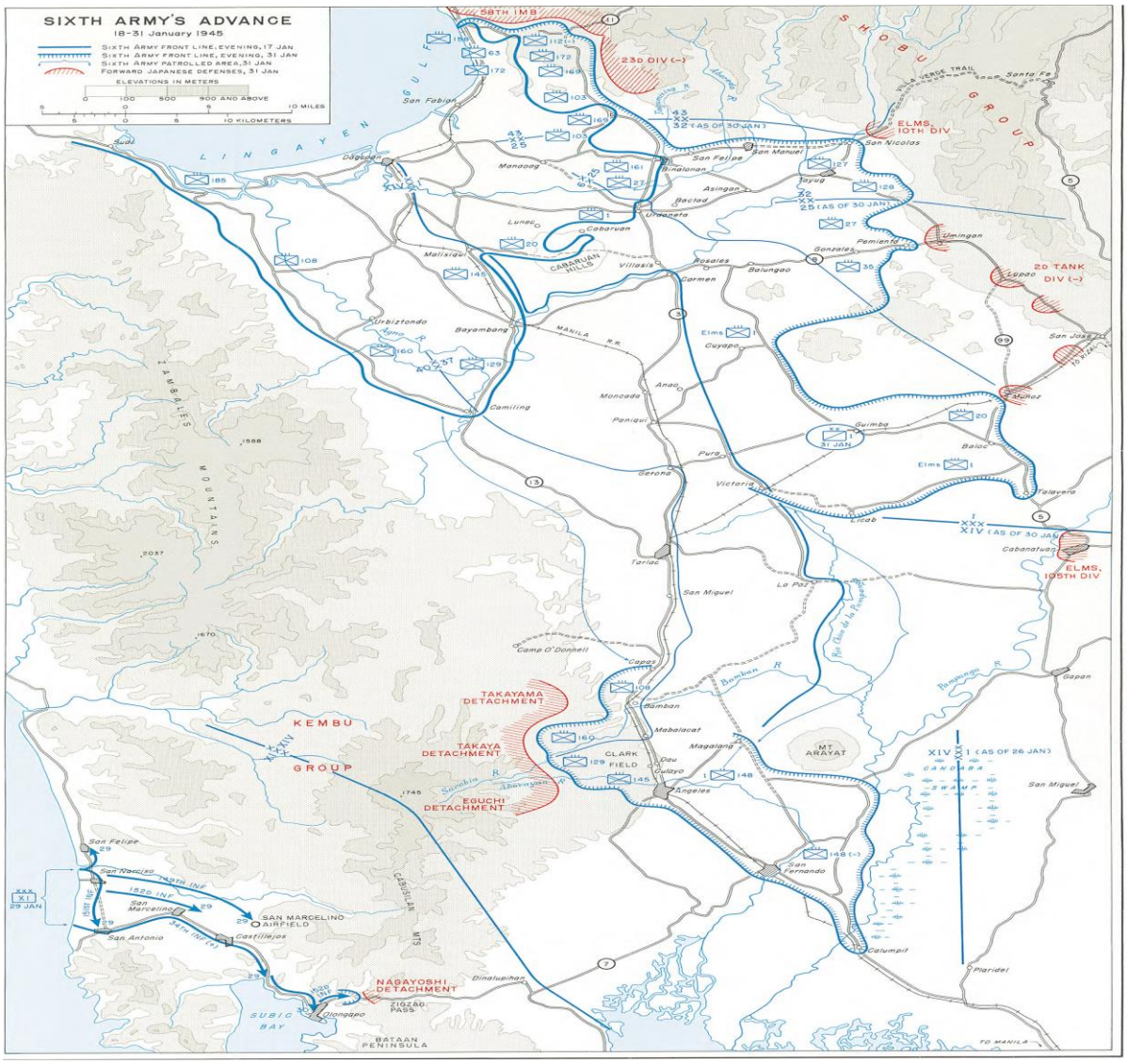

Figure 4: Map overlay of Sixth Army's advance from the Lingayen assault area, South in the direction of Manila. Map from Smith, *United States Army in World War II: The War in the Pacific: Triumph in the Philippines*, (1963; repr., Washington, DC: Center of Military History, 2005), 759.

[392] Robert Ross Smith, *United States Army in World War II: The War in the Pacific: Triumph in the Philippines*, (1963; repr., Washington, DC: Center of Military History, 2005), 128.

From a military perspective, this was an extremely inefficient means by which to conquer such obstacles. For Krueger and his commanders throughout the Sixth Army, this was tactically unsustainable. For I Corps especially this amplified their inherently more tedious assignment on the Sixth Army's left flank. While SWPA General Headquarters (GHQ) and Sixth Army's respective concepts of operations afforded the XIV Corps a line of advance through the more favorable (mobility) topography of the Central Plains region, the I Corps to their left had less suitable ground. The gap and river crossing details aside, I Corps, again comprised of the 6th and 43rd Infantry Divisions (each with their organic combat engineer Battalions of the 6th and 118th respectively) had the responsibility for covering the Army's flank by reducing Japanese defensive emplacements situated in the Cabaruan Hills running North to South, a string of elevated topography comprising in effect a definitive boundary on the Central Plains Eastern edge. This proved to be the Japanese most redoubtable initial opposition to Kruger's landings and a corresponding challenge to the combat engineer battalions to ensure the mobility of the assaulting combat formations.[393]

As the combat engineers dealt with the widespread and persistent issue of bridging to sustain a high operational tempo, on the Army's left flank they also on a more significant scale, had to seek and destroy Japanese emplacements, mines, and obstacles and in specific instances, improve or construct outright new roadways to facilitate onward movement.[394] The degree of engineer support to not only the initial assault landings but to the breakout and follow-on operations was expansive, in scope and scale. Therefore, SWPA GHQ attached to the Sixth Army

[393] Staff of General Douglas MacArthur, *Reports of General MacArthur: The Campaigns of MacArthur in the Pacific,* vol. 1, (Washington, DC: Office of the Chief of Military History, Department of the Army, 1950), 261.

[394] Dod, *United States Army in World War II: The Technical Services: The Corps of Engineers: The War Against Japan*, (1966, repr., Washington, D.C.: Center of Military History, United States Army, 1987), 594-98.

additional engineer units and necessary command and control elements such as the 5202[d] Engineer Construction Brigade and multiple Engineer Group Headquarters (Combat) units to meet the tactical and operational challenges.[395] Naturally, with the Eighth Army's intended subsequent entry into the Luzon operation, it would add to the mix its organic and attached combat engineer units.

Kruger by all accords was a more deliberate strategist and less inclined to push his formations with audacity than that of his superior, Gen. MacArthur, and, to MacArthur's irascible Chief of Staff, Lt. Gen. Richard Sutherland, reportedly.[396] McManus in *To the End of the Earth* offers a quote ascribed to Sutherland made amid operations on Luzon in which the SWPA GHQ Chief of Staff reveals both his dislike for Kruger and a desire to have for himself the command of the Sixth Army. That remark is if he (Sutherland) had been in that position, "we'd be in Manila by now."[397] Such an assertion by Sutherland then and historians in the intervening years disregards or outright ignores the operational challenges under which Kruger and especially his commanders at the tactical level had to function. Across the spectrum of US Army engineer bridging "types," be it temporary Bailey Bridge (a British innovation), pontoon (float) bridging, or repair/re-build of existing civilian bridges, the Sixth and later Eighth Army engineers experienced insufficient access to or support of these vital operational components. At least in the invasion's initial phases.

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[395] Ibid, 594.

[396] Mark Perry, *The Most Dangerous Man in America: The Making of Douglas MacArthur* (New York: Basic Books, 2014), 263-66 and McManus, *To the End of the Earth: The US Army and the Downfall of Japan, 1945* (New York: Caliber Books, 2023), 31.

[397] McManus, *To the End of the Earth: The US Army and the Downfall of Japan, 1945* (New York: Caliber Books, 2023), 31.

That said, the engineer branch, both at the individual soldier and collective or unit levels, displayed an ingenuity often ascribed to the branch.[398] It should be noted however, that while this remained an issue with the Army's vanguard units throughout operations on Luzon, in the respective communication zones, behind the "front" lines, Robert Ross Smith points out that with the arrival of the service (construction) engineer units, bridging as an impediment lessened as these engineers whose role it was to perform more detailed, semi-permanent construction, with access to more acceptable levels of material, attended to this matter.[399] But for those combat elements at the head of the Americans' advance, improvisation became an almost doctrinal element in and of itself for the combat engineers in their bridging efforts to support operational progression. Planners at each command level expected this tactical reality and necessity. From the initial planning stage for the invasion, Sixth Army Engineer, Brig. Gen. Samuel D. Sturgis identified that the lack of availability of bridging would present a tactical problem and to help mitigate the impact of that reality, Sturgis intended to bound forward the Army's float or pontoon bridging assets.[400] With construction engineer units replacing them with structures of a more permanent nature as the front or battle line advanced South. The US Eighth Army under the command of Lt. Gen. Robert Eichelberger effectively entered the fray with the landing of XI Corps within the vicinity of Bataan on 29 January 1945. With this move in conjunction with the Sixth Army's increasing tactical momentum, the securing of Manila loomed upon the operational horizon.

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[398] Carl Mann, *He's In the Engineers Now* (New York: Robert M. McBride & Company, 1943), 48.

[399] Smith, *United States Army in World War II: The War in the Pacific: Triumph in the Philippines*, (1963; repr., Washington, DC: Center of Military History, 2005), 128.

[400] Dod, *United States Army in World War II: The Technical Services: The Corps of Engineers: The War Against Japan*, (1966, repr., Washington, D.C.: Center of Military History, United States Army, 1987), 590.

The status of the Philippines' capital city regarding military operations was murky, but in retrospect, the researcher might conclude it should not have been, that uncertainty emanating from the American perspective. MacArthur appears to have ascribed to not only Yamashita, but all Japanese senior leaders, the belief that they would like MacArthur in 1942, declare Manila an open city to spare the residents and infrastructure from destruction associated with combat operations. The readers should note that there were considerable numbers of prisoners of war and civilian "internees" or prisoners within the city's limits that MacArthur and other senior Americans were concerned with what Japanese intentions and actions might be in response to fighting occurring in and around Manila.[401] These concerns authors James Scott and Walter Borneman speculate helped stoke MacArthur's desire to see the operational tempo, especially that XIV Corps, accelerated.[402] But for MacArthur's combat engineers, the approach to and battle for Manila simultaneously meant more of the same, especially concerning gap crossings and like the rest of the SWPA's jungle veterans, the introduction of urban combat.

With each successive mile bringing the US Sixth and Eighth Armies' formations closer to Manila, the Japanese determination to fight and die in place grew more resolute. Yamashita knew from the outset that he could not defeat MacArthur and eject American forces from Luzon or the Philippines in general. Nor did the Central Plains offer sufficient ground from which to conduct defensive operations, particularly when the US would have aerial superiority. Thus, Yamashita's plan to harass the US advance down from Lingayen from the highlands to the East and West of

[401] James Scott, *Rampage: MacArthur, Yamashita, and the Battle of Manila* (New York: W. W. Norton & Company, 2018), 77.

[402] Ibid and Walter R. Borneman, *MacArthur At War: World War II in the Pacific* (New York: Little, Brown & Company, 2016), 466.

the plains.[403] As US formations maneuvered further South, not only did the fighting become more bitter, but the intended destruction of existing bridges along the roadways converging in Manila by the withdrawing Japanese became more frequent.[404] Also more frequent for the combat engineers in the final approaches to Manila was the requirement to locate and disarm mines hastily emplaced by the Japanese before they were displaced to a subsequent line of defense.[405] Deciding to forego a determined stance in Manila's northern sectors, local Japanese commanders instead decided to conduct their ultimate defense in the southern portion of the city, across the Pasig River which bisected Manila.[406] In so doing, they effort to blow and thereby destroy as many of the existing bridges as they reasonably could expect to.[407] Again, the combat engineers were called upon to rectify this situation and facilitate the continued mobility of the maneuvering combat elements. The Eighth Army's 37th Infantry Division was at the front of the US advance across the Pasig and to enable their Southward advance, the 117th Engineer Battalion (Combat) was assigned to first reconnoiter for the most opportune assault crossing sites, help establish far-side security on the river's Southern bank and emplace across the river a bridge.[408] This was all eventually accomplished, albeit with great effort due to the constant Japanese direct and indirect fire under which the combat engineers had to conduct their activities.

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[403] Smith, *United States Army in World War II: The War in the Pacific: Triumph in the Philippines*, (1963; repr., Washington, DC: Center of Military History, 2005), 128.

[404] Dod, *United States Army in World War II: The Technical Services: The Corps of Engineers: The War Against Japan*, (1966, repr., Washington, D.C.: Center of Military History, United States Army, 1987), 614.

[405] Ibid, 615.

[406] Scott, *Rampage: MacArthur, Yamashita, and the Battle of Manila* (New York: W. W. Norton & Company, 2018), 225.

[407] Dod, *United States Army in World War II: The Technical Services: The Corps of Engineers: The War Against Japan*, (1966, repr., Washington, D.C.: Center of Military History, United States Army, 1987), 615.

[408] Ibid, 615-16.

Combat in urban or built-up terrain is naturally an inhibitor to tactical mobility and maneuverability. The combat engineers' doctrinal tasks did not fundamentally change, but the tactics, techniques, and procedures (TTP) by which they completed them did by adaptation to the situational realities of the time, place, and enemy. Karl Dod discusses how the combat engineers in close concert with the infantry and tanks utilized demolitions to reduce Japanese fighting positions established both as stand-alone structures and inside existing civilian buildings.[409] It warrants noting that the Army's artillery and combat engineers provided mutual support throughout the Luzon campaign, the arduous urban fighting within Manila, and the entire war as elements of the combined arms operational concept. The expected and inherent debris that results from urban battle offers enhanced cover and concealment for combatants, especially the defender. Those executing a defense may utilize such rubble, as the Japanese did in Manila, as a critical element of their intention to deny roadway access, diverting vehicles and infantry into more restrictive areas or terrain and ambushes. Combining these elements within this context with additional munitions such as anti-personal and anti-vehicle/tank mines only added to the lethality of the Japanese defenses and obstructed or at least encumbered the US assault.

Maj. Gen. Hugh Casey, MacArthur's Chief Engineer on the SWPA HQ staff, and his Engineer Section staffers in their post-war summary recount the combat engineer mine removal TTPs performed with tanks. Combat engineers positioned behind a tank on foot, once someone positively identified a mine and under the covering fire of the tank's machine gun, a single engineer would rush forward of the tank disarm the mine and connect to it a cable already secured to the tank at the other end. The engineer soldier having safely, hopefully, returned to the

[409] Ibid, 617.

tank's rear, said the tank would reverse and "remove" the mine in question.[410] The combined arms team would repeat this procedure as often as necessary, with a different combat engineer soldier disarming the mine(s) with each iteration.[411] Not surprisingly, Casey's report notes that the respective engineer headquarters rotated their soldiers through this assignment with regularity.[412] The prevalence of mines within the context of urban debris and mobility restriction was most notable south of the Pasig.[413] Japanese defenders attempted to further impede US tank mobility through the utilization of what could be identified in general as tank traps. These were expedient and took the form of whatever at-hand materials and topographical peculiarities presented themselves. Another role for the combat engineers in enabling armored and vehicular mobility was to remove, or fill, these obstacles.[414]

While the Luzon campaign had diverging tactical challenges and characteristics from CARTWHEEL, most notably concerning the primary means of mobility and maneuver, the infantry on Luzon remained the "sledgehammer" of US Army combat power in this operation. The confrontations within the confining spaces and structures of Manila necessitated that the infantry, with combat engineer support, move throughout the city and its rubble dismounted, or on foot. From structure to structure, infantrymen and engineers had to clear out and as necessary

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[410] Office of the Chief of Engineer, Major General Hugh Casey, *Engineers of the Southwest Pacific 1941-45, Volume I*: *Engineers in the Theater Operations*, Reports of Operations United States Army Forces in the Far East, Southwest Pacific Area, Army Forces Pacific, 1947, 255.

[411] Ibid.

[412] Ibid.

[413] Staff of General Douglas MacArthur, *Reports of General MacArthur: The Campaigns of MacArthur in the Pacific,* vol. 1, (Washington, DC: Office of the Chief of Military History, Department of the Army, 1950), 275.

[414] Major General Hugh Casey, *Engineers of the Southwest Pacific 1941-45, Volume I*: *Engineers in the Theater Operations*, Reports of Operations United States Army Forces in the Far East, Southwest Pacific Area, Army Forces Pacific, 1947, 255.

defeat Japanese defenders in close or even hand-to-hand combat.[415] The combat engineers with a matter of regularity had to emplace and activate demolitions to reduce overly stubborn Japanese soldiers or fortified fighting positions that the infantry could not destroy, tanks could not maneuver to, or artillery could not engage without endangering US soldiers or non-combatants within the immediate vicinity of the given position.[416] While the combat engineers may not have suffered large numbers of casualties, the campaign proved to be an arduous one.

Manila's capture did not equate to the end of Japanese resistance and therefore combat either on Luzon or the archipelago. The US Army and its combat engineers had much more yet to accomplish here, throughout the balance of the SWPA theater of operations, and the entirety of the Pacific for MacArthur to achieve a strategic victory. What the invasion of Luzon, the drive on Manila, and the eventual struggle to control the city offer is a unique operational experience for these soldiers, and all the participating soldiers, who fought the Japanese across the spectrum of the SWPA. It is for the historian or reader a contrast to what the overarching experience of the soldiers of the SWPA experienced in the balance of their wartime experience. The distinctness between the CARTWHEEL and Luzon campaigns highlights an element of war that is true above everything else. That is for soldiers and their leaders to be ever vigilant for constant change in war.

The combat engineer experiences shifting conditions at the tactical level more so than other branches, but if not more than others, at least equal to them. War in all its complexities can be, as Clausewitz surmised, at least in theory, as a formulation of angles and bodies about each

[415] Ibid.

[416] Ibid.

other.[417] What he characterizes as the "geometric factor," meaning the maneuvering of one's forces into that advantageous position.[418] War and combat, however, are not simply mathematical equations, they are violent and often in regions and under conditions far from ideal, if not outright deplorable. But Clausewitz supposes that maneuver and mobility are phases or elements of tactics or the engagement to use his verbiage.[419] For the US Army in the SWPA movement to and within the SWPA was a monumental undertaking considering the distances from the US proper. Contemplation of that fact leads to the appreciation of the effort it required for the US to fight this war. Beyond that, it demonstrates the importance of acquiring a succession of airfields and ports in advancing the front line in joint and combined arms fashion. In this real-world application of mobility theory, the combat engineers were essential facilitators.

The conditions under which the US Army engaged the Japanese were austere and tactically challenging. As such, operations consisted of infantry combat requiring combat engineer support in establishing footpaths, bridges, and elimination of Japanese emplacements. In those early operations such as during the CARTWHEEL campaign, combat engineers periodically had to fight as infantry. During the invasion of Luzon and the subsequent advance towards Manila and the eventual battle within its boundaries, the combat engineers, for the only time in the SWPA, fulfilled their doctrinal role as envisioned in the contemporary US Army. A military organization that had been preparing to meet on the battlefield an enemy that was its mirror image in a technological sense and an environment more favorable to such technologies.

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[417] Clausewitz, *On War*, ed. and trans. Michael Howard and Peter Paret (Princeton: Princeton University Press, 1976), 214.

[418] Ibid.

[419] Ibid.

Why have combat engineers in the first place? Could infantry, tanks, or artillery ensure their mobility to and on the battlefield?

The direct answer is no. Mobility across varying topographical features while simultaneously eliminating enemy obstacles and fortifications required a level of technical aptitude. That was true of the combat engineers despite the hasty nature of technical missions or projects compared to the engineer service units. For combat or maneuver units to attempt tactical operations while undertaking engineer missions would have been detrimental to the former. What combined arms operations represented through the doctrinal application of each arm and branch component was the need for functional mastery by each as part of a multi-faceted military force. The more flexibility a combat team had, so the theory went, the more lethality they would bring to the fight. The combat engineers, demonstrated during both CARTWHEEL and on Luzon were themselves a microcosm of this multiplicity and its potential and benefit to the combatant commander. All these capabilities ensure the mobility of the decisive combat effects.

Leadership, again, merits annotation as the impetus for every element of military operations. It is the catapult for identifying the tactical problem, establishing the vision of a successful end state, providing parameters for planning, and eventually furnishing the direction and motivation on the battlefield. Leaders are more importantly responsible for the training, equipping, and well-being of their soldiers, and that harsh context of the SWPA was a responsibility unto itself. Combat engineer leaders, as discussed throughout this study, had to have the requisite technical literacy to diagnose an obstacle or problem at hand in combat and an immediate period, devise a solution, organize their formation accordingly, and execute. Discussion of mobility doctrine or TTPs associated with the combat engineers is moot without at least acknowledging in passing the essential role and contributions of leadership at all levels.

Leadership was just as, if not more necessary, as the engineers took on an entirely new operational role associated with the maritime reality of the SWPA and its place within the branch's mission of ensuring maneuverability and mobility. That was the element of conducting amphibious landings or assaults to place upon land the US Army's combat formations.

Chapter VII:

A New Role of Amphibious Operations for the Combat Engineers

The physical nature of the Pacific War necessitated the elementary role of amphibious capability. Military theorists and practitioners have traditionally understood combat to require participating formations to move to and within the battlespace and that truism does not change when conducting operations across the water and onto isolated islands.[420] In this context, the Army assigning the responsibility for the execution of amphibious operations to the engineer branch is logical. Likewise, there is a correlation between this amphibious mission and the combat engineers. In establishing the amphibious capability engineer leadership drew from their various skill sets to utilize as the genesis for this new operational requirement. That of course included the combat engineers, and the inherent mobility and maneuverability aspect of amphibious operations rendered it remarkably close tactically, to the combat engineers. Brigadier General (Brig. Gen.) William F. Heavey inferred the symbiotic process of amphibious operations with combat when he characterized the former as inherently offensive.[421]

Brig. Gen. Heavey's broader point was that the United States could only defeat Japan, Germany, and Italy by seizing and maintaining offensive operations.[422] Not only at the tactical level but at the strategic as well. In the SWPA this equated to persistent amphibious assault operations intended to achieve tactical surprise for the US and its allies, the Australians, and not only strong-arming Japan into a defensive posture but complicating operational planning by keeping them off-balance and guessing as to when and where MacArthur would strike next. As

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[420] Carl Von Clausewitz, *On War*, ed. and trans. Michael Howard and Peter Paret (Princeton: Princeton University Press, 1976), 180.

[421] Brigadier General William F. Heavey, *Down Ramp! The Story of the Army Amphibian Engineers*, (Washington, D.C.: 1947), 1.

[422] Ibid.

the US fully girded itself for the Pacific War throughout 1942, the Army and Navy had to establish a joint operational concept that incorporated not only how the amphibious phases of these missions would transpire, but who would execute each element.[423] With the US Navy facing the immense strategic responsibility of strategic transport in support of worldwide operations, the tactical element of amphibious assaults in the SWPA, it was decided by the US Chiefs of Staff, would best be served by the Army taking on that role.[424] And that role, Army leadership decided, fit the engineers.[425]

Amphibious assaults on an enemy-occupied beach were an inherently complex operation requiring much inter-service and branch coordination. Meaning that it would require planning, training, and operational development beyond simply assigning combat engineers to operate landing craft or boats and shore party activities culminating with the delivery of infantry or tanks to a selected landing site. Transforming engineers into amphibious engineers required skills in water navigation, landing craft maintenance, and fire support while maneuvering, clearing the landing beaches, and ensuring combat formation mobility off the beaches.[426] Therefore, to attain the desired result of this mission, speed, and accuracy were necessary in each of these combat operations' initial phases. The US Army and Gen. MacArthur would not have won the war in the SWPA without the successful application of the amphibious engineers' emergent doctrine.

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[423] Office of the Chief of Engineer, Major General Hugh Casey, *Engineers of the Southwest Pacific 1941-45, Volume IV*: *Amphibian Engineer Operations*, Reports of Operations United States Army Forces in the Far East, Southwest Pacific Area, Army Forces Pacific, 1959, 16.

[424] Ibid.

[425] Ibid.

[426] Colonel Arthur G. Trudeau, "The Engineer Amphibian Command," *Military Review* XXXIII, no. 6 (September 1943), 16-17.

The amphibious component of the Army's SWPA in each of its sub-components correlated with the engineers' fundamental role of mobility assurance. Such a perspective both validates in retrospect the Army's decision to assign this to the engineers and provides context from which to examine the operational record of these soldiers and units more appropriately within the war as fought in the SWPA. Across the capacious World War II experience of the engineers and associated doctrinal evolution, the development of amphibious engineers, with consideration to the aviation and airborne engineers, was the most dynamic. This supposition however contrasts with the conclusion of some contemporaneous officers who aligned the amphibious element with the services component rather than the combat.[427] That supposition however emanated from associating the amphibious mission with transportation and supply as opposed to combat projection.[428] It is not the central thesis of this work or chapter to argue why the amphibious engineers were more closely affiliated with the combat aspect, but a brief discussion is warranted as the combat element of US Army engineers in SWPA is a principal element of this dissertation. Straightaway, invalidated is the view of the amphibious engineers as logisticians in the absence of a tactical mission to support them. Transporting supplies to an established supply repository or base was a strategic mission and that remained the responsibility of the US Navy.

Regarding the transportation notion, yes, the assault formations along with their munitions in this theater required movement via waterborne craft. Other than airborne drops, on small islands (an altogether unviable means for large-scale operations other than on New Guinea or extremely small-scale raids such as on Corregidor in the Philippines), this was the only means

[427] Ibid, 13.

[428] Ibid.

by which to conduct assaults. Reiterating an earlier point, assaulting a beach either known or believed to be enemy-occupied based upon that fact alone, renders the amphibious phase of ship-to-shore or shore-to-shore, a combat maneuver just as if tanks were maneuvering to conduct a flank attack on the continent of Western Europe. The shore party element of the formations bolsters the argument of the amphibians being a combat function. Within each amphibious or later, special brigade was an engineer shore regiment.[429] Succinctly stated, Colonel (Col.) Trudeau noted that the engineers of this formation were to complete the "organization of the far shore."[430] The far shore is the assault (or landing) beach representing the initial mission objective. Blanche Coll, Jean Keith, and Herbert Rosenthal academically settled the discussion by noting that the Army Ground Forces (AGF) were responsible for organizing and initial training the amphibious brigades.[431] The far shore organization consisted of engineers having to demolish (blow via explosives) enemy obstacles, fencing, or fighting emplacements, clear mines, mark the landing limits to outline the assault beach(es), clear, repair, and construct (hastily) roads off the beach(es) and as necessary, fight as infantry.[432]

The doctrine associated with operational missions and individual soldier occupational skills was revolutionary in the war era. The urgency and peculiar impetus associated with the hasty doctrinal contrivance were attributable to the failure to foresee such a need during the

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[429] Chief of Engineer, Major General Hugh Casey, *Engineers of the Southwest Pacific 1941-45, Volume IV*: *Amphibian Engineer Operations*, Reports of Operations United States Army Forces in the Far East, Southwest Pacific Area, Army Forces Pacific, 1959, 23.

[430] Trudeau, "The Engineer Amphibian Command," *Military Review* XXXIII, no. 6 (September 1943), 13.

[431] Blanche D. Coll, Jean E. Keith, and Herbert H. Rosenthal, *United States Army in World War II: The Technical Services: The Corps of Engineers: Troops and Equipment*, (1958; repr., Washington, D.C.: Center of Military History, United States Army, 2002), 222.

[432] Carl Mann, *He's in the Engineers Now*, (New York: Robert M. McBride & Company, 1943), 112.

interwar period as much as prudence. The near-universal assessment of this situation and narrative of the amphibians' evolution, including no less than Brig. Gen. Heavey puts forth this conclusion.[433] It is not the intention of this statement to be a negative injunction of Army and engineer branch leadership between the world wars. It does, however, represent another example of the unpreparedness that was widespread throughout the US Army in 1941. It also illustrates that fighting a war in every region and contextual setting in the world simultaneously is difficult, if not near impossible, for any army to prepare for. The speed with which the Army implemented this functionality and proficiency demonstrated, speaks well of the engineer branch's organizational flexibility and dexterity. The researcher must acknowledge that the US Navy and Marines Corps work on amphibious assaults and operations contributed to the Army's development of its tactical doctrine in that the latter did not have to build it entirely from scratch.[434] But, that fact should not in any way detract from the noteworthy accomplishment of the soldiers, non-commissioned officers, and officers of the Army who effectively performed these missions. And did so in the war with Japan more than their Marine Corps brethren.[435]

The implied benefit of the amphibious engineers to Gen. MacArthur was that it defanged the argument that the SWPA was an unnecessary theater of operations if for no other reason than the Navy and Marines could not support such operations while simultaneously pursuing their strategic objectives in the Central Pacific. By eliminating or at least significantly scaling back the

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[433] Heavey, *Down Ramp! The Story of the Army Amphibian Engineers*, (Washington, D.C.: 1947), 1.

[434] Chief of Engineer, Major General Hugh Casey, *Engineers of the Southwest Pacific 1941-45, Volume IV*: *Amphibian Engineer Operations*, Reports of Operations United States Army Forces in the Far East, Southwest Pacific Area, Army Forces Pacific, 1959, 10.

[435] John C. McManus, *Fire and Fortitude: The US Army in the Pacific War, 1941-1943* (New York: Caliber, 2019), 5 and Chief of Engineer, Major General Hugh Casey, *Engineers of the Southwest Pacific 1941-45, Volume IV*: *Amphibian Engineer Operations*, Reports of Operations United States Army Forces in the Far East, Southwest Pacific Area, Army Forces Pacific, 1959, 698.

need for naval and marine tactical support, MacArthur could justify his strategic arguments by utilizing holistic Army capabilities. That was an easy argument to make on paper and from within the hypothetical realm. The ultimate determinant is the availability, or lack of, enough of the necessary landing craft to alchemize this to reality.[436] Complicating the already hardscrabble doctrinal progression of amphibious operations was the inherent joint nature of these activities. Despite the agreement between the Army and Navy that the former should be the action agent for shore-to-shore and as it proved to include ship-to-shore requirements, the latter had an ever-present role. The fact that the US Navy provided the primary means of amphibious mobility, the boats, highlights this. Whether the soldiers identified to fill the ranks of the amphibious formations and positions transferred from within the engineers, another military occupation, or as a recruit or draftee, the Navy would imprint their education and collective operational doctrine.

Figure 5: Landing Vehicle Tracked (LVT) known as the "Buffalo" transporting members of the 2nd Battalion, 186th Infantry across Sentani Lake, Netherlands, New Guinea supporting the final assaults on Japanese-held airfields. From: Chief of Engineer, Major General Hugh Casey, Engineers of the Southwest Pacific 1941-45, Volume IV: Amphibian Engineer Operations, Reports of Operations United States Army Forces in the Far East, Southwest Pacific Area, Army Forces Pacific, 1959, 305.

[436] Staff of General Douglas MacArthur, *Reports of General MacArthur: The Campaigns of MacArthur in the Pacific,* vol. 1, (Washington, DC: Office of the Chief of Military History, Department of the Army, 1950), 79.

Naturally, doctrinal evolution was not solely associated with the enlisted soldiers' tasks of operating and maintaining boats or performing shore activities, but also a need for their commissioned officers. Leaders at all levels, commissioned and non-commissioned alike, were critical to amphibious operations. Not only the culmination as witnessed in the tactical result but also in training and pre-operational planning. Such a supposition does not offer new academic insight or revolutionary leadership principles, it does once again reinforce the inescapable element of leadership in successful military operations. The analyst may even postulate that concerning amphibious operations, leadership assumed increased prominence. The level of coordination both within the brigades internally and with supporting and supported organizations to place the latter at the appointed beach at the appointed time was immense.[437] Coll, Keith, and Rosenthal reiterated that another critical aspect of amphibious operational leadership was the persistent if not underlying, inter-service angst.[438]

By now the reader and researcher should understand that this tug-of-war permeated the Pacific War. However, a thorough examination of the records, both primary and secondary, yields the impression that it existed more at the strategic level than at the tactical level. Concerning the characterization of the latter, one can simply attribute this to necessity. Operational commanders, especially those responsible for amphibious operations, did not have the luxury of time to engage in what the historical observer could view as adolescent distractions. For the Army officers and non-commissioned officers especially, they had to speedily as reasonable, become to a relative degree, if not full-fledged sailors, at least well-versed in maritime vernacular and operations. At

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[437] Trudeau, "The Engineer Amphibian Command," *Military Review* XXIII, no. 6 (September 1943), 17.

[438] Coll, Keith, and Rosenthal, *United States Army in World War II: The Technical Services: The Corps of Engineers: Troops and Equipment*, (1958; repr., Washington, D.C.: Center of Military History, United States Army, 2002), 359.

least those assigned to the boat operations and maintenance battalions. For those allocated to shore party formations, they had to likewise develop skills associated with performing necessary beach organization and more importantly directing those activities. Kevin Holzimmer asserts that joint US Army-Navy planning and execution hit its operational stride during preparations for the Hollandia operation.[439] From the Army's perspective, such a conclusion correlates to Carl Mann's description of the requisite qualities for the engineer leader. He had the appropriate intellectual acuity and flexibility to not only learn new skills but to varying degrees master them. Mann furthermore conveyed the Army's need to fill its leadership positions with those who could effectively motivate and direct others, or soldiers placed in their stead.[440]

The intersection between doctrine and leadership was more pronounced relating to amphibious soldiers and units. The 1941 version of *Field Manual (FM) 100-5: Operations* conveyed, in a broad sense, that Army offensive doctrine had three requirements. Those being the preservation of combat power in the echelon, freedom of maneuver to close with the enemy, and the consistent application of combat power until the defeat of the enemy.[441] That then had a direct correlation to amphibious leadership first, by acknowledging that leadership, in the military realm was, and is, not external to doctrine. As noted earlier in this chapter, amphibious operations were manifestly a means of movement to and within the battlespace. The natural variance between battlefields required leaders at the tactical levels to quickly surmise the situation, arrange a plan of action, and direct execution of that plan. For the amphibious engineer

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[439] Kevin C. Holzimmer, "Joint Operations in the Southwest Pacific, 1943-1945," *Joint Force Quarterly: JFQ* no. 38 (Third Quarter 2005), 104.

[440] Mann, *He's in the Engineers Now*, (New York: Robert M. McBride & Company, 1943), 61-2.

[441] United States Army, *FM 100-5: Field Service Regulations: Operations*, (Washington, DC: United States War Department, 1941), 103.

officers and non-commissioned officers in those initial operations at Nassau Bay, Lae, and Finschhafen along the New Guinea coasts this proof of principle was like their soldiers, a baptism by fire.

These commanders and leaders not only had to direct operations but in a larger sense through these missions validate some elements of doctrine while identifying those fundamentals that required refinement or dismissed altogether and where there were gaps in doctrine. This of course is an inherent aspect of the Army leader in every branch during every operation and period of conflict. But for the amphibious engineer executive in the SWPA, it was a novel concept. At least to the US Army. That fact too added another facet to the leader's burden and that was ensuring that the US Army could organize and execute such operations. This had been and remained within the purview of the US Navy and Marine Corps. There remained those who believed that it should have remained that way, regardless of the expediencies of the time.[442] While some of that ilk viewed this in what they believed to be operational pragmatism, there were others whose opinions emanated from the persistent sibling rivalry for command authority.

Central to the success of joint Army-Navy amphibious operations such as Holzimmer and others have characterized the experience of the SWPA was the willingness of tactical leaders to recognize lessons from each operation and to share them with higher-level commands. Operational feedback is a crucial element of doctrinal development during and after wartime experiences. An important aspect of these activities that the amphibians experienced during these early operations that were critical to their further development and proficiency was that of direct

[442] Lieutenant Earl Burton, USNR, *By Sea and by Land: The Story of our Amphibious Forces*, (New York: Whittlesey House, 1944), 64.

combat.[443] At Nassau Bay, after successfully conducting an amphibious landing at night amidst a storm that created choppy waters and large waves, the amphibious engineers of the 532[d] Engineer Boat and Shore Regiment lost 21 of their landing craft as a result of these conditions.[444] Unable therefore to extricate themselves from the landing beach, these engineers reported to the infantry commander on the ground who decided to utilize these stranded amphibians to supplant his infantry and assigned the former a position on the far left flank of his present position for the night.[445] While the initial landings had been without interference from the occupying Japanese, overnight the local Imperial Japanese Army commander determined to counter-attack. This included the portion of the line occupied by the amphibious engineers of the 532[d]. Like many of their combat engineer brethren similarly required to take up the M1-Garand rifle or .30 caliber machine gun and fight as infantry, these amphibians by all accords, gave tremendous account of themselves in this scenario.[446] The bottom line is that the amphibious engineer doctrine while focused upon the technical requirements of their amphibious and shore party charters, must adhere to the Army's foundational principle that all soldiers ultimately are infantrymen.

These maiden missions not only provided leadership with areas requiring improvement but, as importantly, validated important aspects of this new amphibious doctrine. Such as confirmation that Army soldiers piloting these small craft could effectively maneuver them

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[443] Chief of Engineer, Major General Hugh Casey, *Engineers of the Southwest Pacific 1941-45, Volume IV*: *Amphibian Engineer Operations*, Reports of Operations United States Army Forces in the Far East, Southwest Pacific Area, Army Forces Pacific, 1959, 82.

[444] Heavey, *Down Ramp! The Story of the Army Amphibian Engineers*, (Washington, D.C.: Infantry Journal Press, 1947), 60-3.

[445] Ibid, 61.

[446] John Miller, jr., *United States Army in World War II: The War in the Pacific: Cartwheel, the Reduction of Rabaul*, (1959; repr., Washington, D.C.: Center of Military History, United States Army, 1969), 62.

between points on shore and under difficult climatic conditions.[447] The amphibious engineers and the US Army had the Navy and Marines Corps thank the relative ease with which the soldiers learned and implemented this role. This amphibious dexterity, combined with the United States personnel and munitions superiority was a strategic and tactical advantage that Japan simply could not overcome. Regardless of the zealousness of their martial spirit. US Army and engineer leaders had to make operational observations and resultant lessons as a tenant of each mission. As wounded and killed because of enemy action or promoted to other responsibilities and units, this knowledge had to become institutionalized to ensure future, enduring success. But this knowledge could not remain within the proprietary realm of those serving in the SWPA at any given time soldiers had to share simultaneously with those responsible for the training of those new soldiers stateside in preparation for future service.

The researcher should not overlook the strategic role and contributions that the amphibious engineers provided to Gen. MacArthur and the wider war effort. As *FM 100-5: Operations* (1941) notes, the engineers had the inherent responsibility for protecting the lines or routes of communications.[448] In the Pacific War, the Navy held the primary obligation for this consideration. But as this chapter noted earlier, due to the scope of this war and the immense operational area, the Army locally within the SWPA and especially among landward objectives closely situated, this became the amphibious engineers' obligation. This brought to the fore the other aspect of joint and combined arms critical to victory in this theater, that of the airplane. Japanese aircraft interdiction of amphibious assaults represented, for American planners and

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[447] Chief of Engineer, Major General Hugh Casey, *Engineers of the Southwest Pacific 1941-45, Volume IV*: *Amphibian Engineer Operations*, Reports of Operations United States Army Forces in the Far East, Southwest Pacific Area, Army Forces Pacific, 1959, 82.

[448] United States Army, *FM 100-5: Field Service Regulations: Operations*, (Washington, DC: United States War Department, 1941), 15.

commanders a significant concern, especially in 1942 and 1943. Therefore, air cover was a crucial operational element and could prove to be a determining factor in whether the Army proceeded with an operational plan or not.[449] That however proved to be the exception rather than the rule, as Maj. Gen. Hugh Casey (Chief Engineer on the SWPA Headquarters staff) noted in his introduction to the report of amphibious engineers of the SWPA, that these engineers and operations they supported could, and at times did, go forth in the absence of aerial support.[450] That decision rested upon the strategic value of the objective in question. Which in the SWPA, was often the seizure of an existing airfield or a landmass deemed sufficient for the construction engineers to develop one to advance the US fighter and bomber lines, respectively. In this scenario, without air support, the amphibious engineers had to use what they had at their disposal. That being primarily the M2 .50-caliber machine gun best suited to engage and destroy attacking Japanese aircraft. The amphibians demonstrated this by accounting for two Japanese fighters during the Lae campaign of 1943.[451]

The predominant impression across the historiography of the war against Japan was the role of US airpower. World War II was the introduction of large-scale air operations as a means of combat, combat support, and service support. In the Pacific, owing to its vastness and the scale of operations, the airplane had an indispensable function within the combined and joint arms team. But, this position, within subsequent accounts and studies of the war, has elevated aviation beyond its true contributions to victory. Especially at the strategic level, the atomic

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[449] Chief of Engineer, Major General Hugh Casey, *Engineers of the Southwest Pacific 1941-45, Volume IV*: *Amphibian Engineer Operations*, Reports of Operations United States Army Forces in the Far East, Southwest Pacific Area, Army Forces Pacific, 1959, 3.

[450] Ibid, v.

[451] Heavey, *Down Ramp! The Story of the Army Amphibian Engineers*, (Washington, D.C.: Infantry Journal Press, 1947), 65.

bombs notwithstanding. The Pacific War remained primarily a naval and land war requiring the securing of sea lanes and corresponding islands and eventually airfields, all of which proved to be mutually supporting. Therefore, the role and contributions of the amphibious engineers were just as, if not more, critical than the pilots and planes of the Army, Navy, and Marine Corps. Advancing the requisite fighter and bomber lines (airfields) was necessary to secure aerial support for subsequent amphibious operations as MacArthur in the SWPA consistently received scant aircraft carrier support. The intention of this work is not by the previous summation to slight the Navy's contributions in this theater, but an acknowledgment of material and operational realities that precluded their consistent and widespread availability.

Since the SWPA was a naval theater, movement upon and control of maritime axes of advance were undoubtedly necessary. It is, therefore, prudent for the student of the SWPA and by default the combat and amphibious engineers to contemplate and attain a basic understanding of the amphibians' primary tool by which this operational piece was plausible. The piece of equipment that was indispensable to the SWPA theater. The landing craft or boats of the engineer amphibious (special) brigades. Brig. Gen. Heavey recounts that in the amphibious brigades' organizational stage, one of the most prominent points of contention the Army and Navy had to resolve was precisely which boats the former would operate.[452] As with every evaluation of military operational history, the analyst cannot disassociate operational command and control from the topic at hand. The boats in question consisted of the 36-foot Landing Craft, Vehicle, Personnel (LCVP) and the Landing Craft, Mechanized (LCM), 50 feet in length and designed to transport trucks, tanks, or artillery all too large for the LCVP.[453] Army employment of these two

[452] Ibid, 10.

[453] Chief of Engineer, Major General Hugh Casey, *Engineers of the Southwest Pacific 1941-45, Volume IV*: *Amphibian Engineer Operations*, Reports of Operations United States Army Forces in the Far East, Southwest

boat types proved to be less divisive than the employment of the larger 105-foot Landing Craft, Tank (LCT). The rub was that the Navy classified the LCT as a ship as opposed to a boat and as a "large" vessel, which should remain within naval operational control.[454]

Figure 6: LVT and LCVP placing assaulting infantry ashore at Arawe, New Britain. From Chief of Engineer, Major General Hugh Casey, Engineers of the Southwest Pacific 1941-45, Volume IV: Amphibian Engineer Operations, Reports of Operations United States Army Forces in the Far East, Southwest Pacific Area, Army Forces Pacific, 1959, 158.

In retrospect, this debate, especially within the context of the SWPA, appears nonsensical. This was an operational theater that the Navy had opposed from the outset.[455] Chief

Pacific Area, Army Forces Pacific, 1959, 18 and Heavey, *Down Ramp! The Story of the Army Amphibian Engineers*, (Washington, D.C.: Infantry Journal Press, 1947), 10.

[454] Ibid, 21 and 10.

[455] Louis Morton, *United States Army in World War II: The War in the Pacific: Strategy and Command: The First Two Years*, (1962; repr., Washington, D.C.: Center of Military History, United States Army, 2000), 244.

of Naval Operations, Admiral (Adm.) Ernest King had the balance of the Pacific War to fight, while also providing support to the effort against Nazi Germany's U-boats in the Northern Atlantic, and logistical and combat support to the Army, first in the Mediterranean followed by the invasion and follow-on campaigns on the European continent. That fact combined with the reality of the limited availability of these landing craft to facilitate operations throughout the globe renders the Navy's overall attitude understandable. However, it also buttresses the Army's argument that Naval limitations, in personnel specifically, made it more practical to have the amphibious engineers assume the widest degree of responsibility in boat operations.[456] For both services, the matter of tactical command and control rested not solely with a conflicting proprietorial impulse by each service, but the most efficient means by which missions were executed, from opening to close. The unity of command principle permeated every Army-Navy joint operation. For the Army and the amphibious or special engineer brigade commander, operating each mission's affiliated landing craft would have meant a greater degree of tactical command and control which was not an issue of control in a narrow, self-serving sense, but the authority and latitude to adjust to the realities of the battlespace more effectively and expeditiously as the mission unfolded. It would also afford the Army, specifically planners and commanders at the army and theater level headquarters, to reduce the lag time between operations by eliminating the need for the Army to await naval availability both in personnel and craft.

[456] Coll, Keith, and Rosenthal, *United States Army in World War II: The Technical Services: The Corps of Engineers: Troops and Equipment*, (1958; repr., Washington, D.C.: Center of Military History, United States Army, 2002), 361.

In doctrinal terms, a key consideration and therefore operational necessity was the need for the closest coordination between the boat pilots and personnel and shore units. Commentators often present military missions as having little margin for error and that leeway is less with amphibious operations. Delivering the engineers designated and responsible for opening, securing, and organizing the designated objective beach(es) required timeliness and accuracy from the boat contingent. This phase had to be successful for the operation's decisive element, the combat formations' landing in a follow-on fashion. Another overlooked element of the engineers responsible for shore party operations was the unloading of those boats transporting equipment and supplies. Congestion, confusion, or outright failure in this activity foretold overall mission failure. The shore party engineers then, while structurally part of the amphibious or special brigade, had tactical correlation with the combat units. It was also common for the shore engineers out of necessity to simultaneously fight as infantry.[457] While having a definitive mission explicitly beyond that of the boatmen's shore party activities linked to the boat operators' actions. Shore engineers found themselves asked to take on actions beyond the more obvious duties of their charter or even as auxiliary infantry throughout the war. During the amphibious assault upon the island of Biak in the spring of 1944, the 2^{d} Brigade commander tasked one of his shore battalions with emplacing pontoon causeways to deepen the water and allow the larger LCTs and LSTs to move in closer to the principal assault beach.[458]

This situation demonstrated the appropriability of organizing the various elements of the amphibious operations under the Army’s operational command and control. Factors such as coral

[457] Unknown, *History of the Second Engineer Special Brigade: United States Army, World War II* (Harrisburg, PA: The Telegraph Press, 1946), 14.

[458] Ibid, 88.

reefs unknown to planners or commanders during the conceptual design period of each operation, could and did prove to be as troublesome as Japanese resistance. Such geological features could prevent the amphibians' landing craft, especially the larger vessels, from attaining the beach. Such as the engineers encountered at Biak. This meant that delivering necessary equipment such as tanks, artillery, or construction engineering equipment became impossible. That left the assaulting combat formations without the intended fire or combat support level. US Army doctrine both during the World War II era and now, requires Army formations to place overwhelming firepower upon enemy soldiers and emplacements to achieve victory.[459] If attacking formations require both numerical and fire support superiority in general, it would appear self-evident then that this is more critical in amphibious assaults.[460]

Figure 7: US infantry disembarking from LCM with ammunition at Yalau Plantation, New Guinea. From Chief of Engineer, Major General Hugh Casey, Engineers of the Southwest Pacific 1941-45, Volume IV: Amphibian Engineer Operations, Reports of Operations United States Army Forces in the Far East, Southwest Pacific Area, Army Forces Pacific, 1959, 207.

This new Army doctrine pursued such a tactical necessity by requiring the amphibious craft to provide covering fire, in addition to any aerial or naval fire support, while maneuvering

[459] United States Army, *FM 7-5: Infantry Field Manual: Organization and Tactics of Infantry: The Rifle Battalion* (Washington, DC: United States War Department, 1940), 28.

[460] United States Army, *FM 100-5: Field Service Regulations: Operations*, (Washington, DC: United States War Department, 1941), 121.

to their given objective. While difficult to objectively qualify in terms of effectiveness, observations cultivated from operational reports, such as those associated with the landings on Los Negros Island in February of 1944 offer some evidence as to the engineers' effectiveness.[461] Soldiers participating in this operation witnessed defending Japanese troops displaced from their primary locations, seeking cover in secondary fighting positions due to the American fire support directed on and within the vicinity of the assault beach.[462] Fire support of amphibious operations did not cease with the debarkation of the shore party engineers responsible for opening and organizing the objective landing beach. While the level of naval and air support may have changed, along with their respective targets, it remained imperative on those beaches that the Japanese chose to defend, that these shore party activities continue to receive such support. Thus, the development of combined arms doctrine in pre-execution planning and communications as part of mission execution was critical to any degree of tactical success.

Maj. Gen. Casey's staff offered a critique of the amphibious doctrine that occurred in the lead-up to MacArthur's return to the Philippine Archipelago.[463] As noted in the previous chapter, military doctrine is not simply precepts associated with combat or tactical actions. It is all-encompassing, driving every element and aspect of US Army actions or the "…body of professional knowledge that guides how soldiers perform tasks related to the Army's role: the

[461] Chief of Engineer, Major General Hugh Casey, *Engineers of the Southwest Pacific 1941-45, Volume IV*: *Amphibian Engineer Operations*, Reports of Operations United States Army Forces in the Far East, Southwest Pacific Area, Army Forces Pacific, 1959, 18 and Heavey, *Down Ramp! The Story of the Army Amphibian Engineers*, (Washington, D.C.: Infantry Journal Press, 1947), 227.

[462] Ibid.

[463] Ibid, 441.

employment of land power in a distinctly American context."[464] Restated simply, anything associated with the Army engaging an enemy is an element of doctrine. Casey's staff retrospective focused on two facets of the amphibians' operational experience from 1943 onward.[465] Those are unit structure equipment type and utilization. The latter segment demonstrates the mutual exclusiveness of the topic. The concerns coloring higher-level discussions associated with the organizational structure of the Engineer Special Brigades explicitly within the SWPA theater were not solely associated with composition characteristics. In a practical sense, these parleys were more of the nature that portrayed the inter-service deliberations between the Army and Navy throughout the war. The command-and-control exercise of each operational portion and therefore units within the brigades as originally composed. This unity of command principle was not then just a tactical consideration between services, but also intra-service.

The point of contention was in having the boat units, shore units, and other ancillary units all under the operational control of the Engineer Special Brigade headquarters. While the idea of dismembering the brigade and assigning these units to the other commands associated with a respective operation does not appear altogether without merit, objectively pursuing such a course of action made little sense. The New Britain amphibious assault(s) during the winter of 1943-44 demonstrated the practicality of maintaining the various amphibian functions under a unified amphibious command. The conditions encountered by the initial and subsequent amphibious

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[464] United States Army, *Army Doctrinal Publication* (*ADP*) *1-01: Doctrine Primer* (Washington, D.C.: Headquarters, Department of the Army, 2019), 1-1.

[465] Chief of Engineer, Major General Hugh Casey, *Engineers of the Southwest Pacific 1941-45, Volume IV*: *Amphibian Engineer Operations*, Reports of Operations United States Army Forces in the Far East, Southwest Pacific Area, Army Forces Pacific, 1959, 18 and Heavey, *Down Ramp! The Story of the Army Amphibian Engineers*, (Washington, D.C.: Infantry Journal Press, 1947), 441-50.

waves of the two mutually supporting landings at Arawe and Cape Gloucester made the unity of command necessary. For example, the reefs permeating the waters immediately adjoining the assault beaches required the utilization of tracked amphibious vehicles to reach the respective beach and deliver the shore parties to establish some level of security and identify (and mark) appropriate lanes through the reefs to facilitate the LCVP maneuvering.[466] That effort notwithstanding, one LCVP did become lodged upon the coral reef and became an inviting target of Japanese fighters within the area.[467] The circumstances associated with the landings at Arawe specifically demonstrate the appropriateness and utilitarian nature of unified command and control under the Engineer Special Brigade Commander and his headquarters staff.

Placing the shore party formations within a separate command from that of the boatsmen would have rendered coordination between the two unnecessarily more difficult than it inherently was, if not altogether impossible. Military operations are complex enough without the external factors of climate and enemy counteractions. At Arawe the difficulties encountered by both the shore and boat units had some officers had their way by separating the commands would have made coordinating their distinct yet inseparable operational actions a futile enterprise. The Army, at least within the SWPA theater, securing operational control of the LCTs appears to have been the genesis for the recommendation for such a radical restructuring of the amphibians from a consolidated regiment to separate battalions. These craft, the reader will recall, were the largest landing boats that as the source of Army and Navy contention the latter retained operational control of. At least initially. But as Maj. Gen. Casey eloquently and effectively argued, that to do

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[466] Karl C. Dod, *United States Army in World War II: The Technical Services: The Corps of Engineers: The War Against Japan,* (1966; repr., Washington, D.C.: Center of Military History, United States Army, 1987), 273.

[467] Ibid.

so would not have made tactical operations such as those on New Britain any easier or more efficient.[468]

Considering the central concern of command coherence within the context of the largest amphibious operations of the SWPA in the war amplifies that priority. The Leyte and Luzon invasions were by any military standard large and complex missions. Operations of such scale and scope leave the researcher contemplating how separate battalions might have adequately affected these landings. Fortunately for the US Eighth and Sixth Armies, they did not have to operate under such circumstances nor deal with resolute Japanese defenses along those beaches. But the bottom line was that the multiple and simultaneous operations under the umbrella of the Engineer Special Brigades required a single authority for execution. War-era US Army doctrine emphasized the "continuity of effort" and tactical flexibility as inherent to the strategic initiative.[469] Amphibious assaults were of course a strategic offensive operation. The dispersion of unit types according to function may appear on the surface to lend itself to greater flexibility because of smaller formations that commanders and planners could assign as needed such a structure was the opposite. The analyst must acknowledge the indispensable need for a simplified and clear chain of command authority. This increased the flexibility of the amphibians' tactical operability by eliminating the problem of conflicting and divergent priorities on the part of any given operation's participating commands.

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[468] Chief of Engineer, Major General Hugh Casey, *Engineers of the Southwest Pacific 1941-45, Volume IV*: *Amphibian Engineer Operations*, Reports of Operations United States Army Forces in the Far East, Southwest Pacific Area, Army Forces Pacific, 1959, 18 and Heavey, *Down Ramp! The Story of the Army Amphibian Engineers*, (Washington, D.C.: Infantry Journal Press, 1947), 443.

[469] United States Army, *FM 100-15: Field Service Regulations: Larger Units*, (Washington, DC: United States War Department, 1942), 31.

The Leyte landings offer a vignette highlighting another component of the Engineer Special Brigades that historiography often overlooks. There are two critical considerations previously touched upon associated with the Pacific War that intersected with the Engineer Special Brigades and their tactical activities. The requirement of the amphibians comprising the shore party formations to organize and facilitate operations at a given landing beach and the enhanced logistical requirements necessary to sustain combat operations in this geographically challenging environment. If the war with Japan across and throughout the Pacific was a naval conflict, it was also one of logistics. Unlike the points of debarkation or assault in the Mediterranean and Western Europe, such sites in the Pacific lacked sufficient ports containing the infrastructure to expeditiously unload, organize, and facilitate sustaining supply operations behind combat operations. That necessity therefore required the amphibious engineers to facilitate shore party activities to amplify initial combat operations, in relative scales, but to simultaneously prepare for concurrent supply operations.[470] The enormous Leyte and Luzon operations amplified this need.[471] During the planning and followed by operational execution, it was determined that the amphibians would again need to be multi-faceted in their role. However, it was not in the role of infantry that they would find themselves performing, but of logisticians and construction engineers.[472]

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[470] Chief of Engineer, Major General Hugh Casey, *Engineers of the Southwest Pacific 1941-45, Volume IV*: *Amphibian Engineer Operations*, Reports of Operations United States Army Forces in the Far East, Southwest Pacific Area, Army Forces Pacific, 1959, 18 and Heavey, *Down Ramp! The Story of the Army Amphibian Engineers*, (Washington, D.C.: Infantry Journal Press, 1947), 461.

[471] Ibid.

[472] . Dod, *The Corps of Engineers: The War Against Japan,* (1966; repr., Washington, D.C.: Center of Military History, United States Army, 1987), 577.

Japanese efforts to interdict the American Philippine landings were half-hearted, but the geologic and maritime circumstances proved more problematic. To US Army strategic and tactical leaders, it was obvious that to sustain any tactical momentum attained during the initial landings the amphibians would need to assist with the facilitation of mobility capability. The historiography of the war or at least the Army's official histories and reports of these missions, notes the contributions made in this area by the amphibians. Supplemented by Naval shore party personnel, the amphibians effectively and quickly overcame these natural obstacles, yet the realities of the physical conditions did result in some congestion in the off-loading of personnel, equipment, and supplies.[473] For the soldiers piloting the landing craft supporting this operation, the efficiency of the debarkation of activities allowed them to execute multiple runs between the Naval transports and landing beaches.[474] This situation and activities demonstrate, yet again, the multi-faceted contributions of the US Army's engineers. The researcher in fact can present the argument that in such an operational environment as experienced in the SWPA, the Special Engineer Brigades served as the connective tissue that enabled the units at the tactical level to make good on the plans and visions of those planners and leaders at the strategic and theater levels. Examination of the historical record and survey of narrative histories of the war leaves the reader with the inevitable question of why historiography has unilaterally overlooked this elementary function of the war in this region.

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[473] Chief of Engineer, Major General Hugh Casey, *Engineers of the Southwest Pacific 1941-45, Volume IV*: *Amphibian Engineer Operations*, Reports of Operations United States Army Forces in the Far East, Southwest Pacific Area, Army Forces Pacific, 1959, 18 and Heavey, *Down Ramp! The Story of the Army Amphibian Engineers*, (Washington, D.C.: Infantry Journal Press, 1947), 461.

[474] Heavey, *Down Ramp! The Story of the Army Amphibian Engineers*, (Washington, D.C.: Infantry Journal Press, 1947), 135.

Maj. Gen. Casey's staff in composing the SWPA engineers' record of the war, consistently recounts either implicitly or explicitly that the amphibious engineers were persistently in short supply. This was about the desire on the part of tactical commanders for the amphibians' operational capabilities, both in operating landing craft and shore party formations. But the overwhelming need for every type and degree of support that the engineer branch's soldiers could provide made this an unrealistic proposition. For instance, despite the importance and scope of the multiple amphibious landings throughout the Philippine Archipelago, the 534th Engineer Boat and Shore Regiment (EBSR) could not provide amphibious and shore activity support to the planned Morotai operation as it was in Australia fabricating steel barges at the intended operational date.[475] At the opposite end of the tactical spectrum, in planning the amphibious assault portion of this operation, Sixth Army planners detached Company C, from the 544th EBSR, removing them from the amphibious operations plan and instead assigned to them a combat role.[476] This application by the Sixth Army operations planners again demonstrates the multi-functional capabilities of the engineers and implies that despite the requisite role of amphibious capability in the SWPA, ultimately, increasing the weight and lethality of assaulting units' combat power was decisive.

In a very tangible sense, the engineers, combat engineers, and amphibians allowed Gen. MacArthur and his subordinate commanders to cover many operational gaps. This was crucial in the SWPA because of the theater's lower priority for soldiers (and therefore units), equipment, and natural characteristics. The amphibious engineers, like their combat engineer brethren,

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[475] Chief of Engineer, Major General Hugh Casey, *Engineers of the Southwest Pacific 1941-45, Volume IV*: *Amphibian Engineer Operations*, Reports of Operations United States Army Forces in the Far East, Southwest Pacific Area, Army Forces Pacific, 1959, 414.

[476] Ibid, 418.

would have experienced a much greater operational variance, speaking, than their branch peers in Western Europe and the Mediterranean.[477] This reality also meant that the amphibious soldiers and units as a finite resource with an infinite operational need in the SWPA theater were in perpetual need and utilization. The Luzon landings in January of 1945 illustrates this reality. The boat crews not only had to ferry the assault troops and their equipment but also the construction engineers, their tools, and the service units required to facilitate the land offensive. They then had to immediately transport supplies between the naval transports and established supply depots on or near the initial landing beaches. But beyond that, to support the Luzon offensive, the Sixth Army planned for subsequent, albeit smaller scale amphibious assaults at other points upon the island.[478] This meant a transfer of the amphibious units to another command-and-control element and sustained operations devoid of significant downtime to rest and rejuvenate. This was in conjunction with ongoing amphibious operations on the island of Leyte on the part of the US Eighth Army.[479] But their work on Luzon would not abate as the Eighth Army would eventually join the Luzon offensive requiring the support of the amphibious engineers yet again.

Such an operational reality was to a large degree only capable through the work of the maintenance soldiers and units of the Engineer Special Brigades. The Army's transition to a modern, technologically structured force comprised of various, complex weapons systems and vehicles necessitated a robust maintenance capability. Specifically related to the amphibious

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[477] Lieutenant Colonel Marvin C. Ellison, "Combat Engineers in Beach Operation," *Military Review* XXV, no. 4 (July 1945), 34.

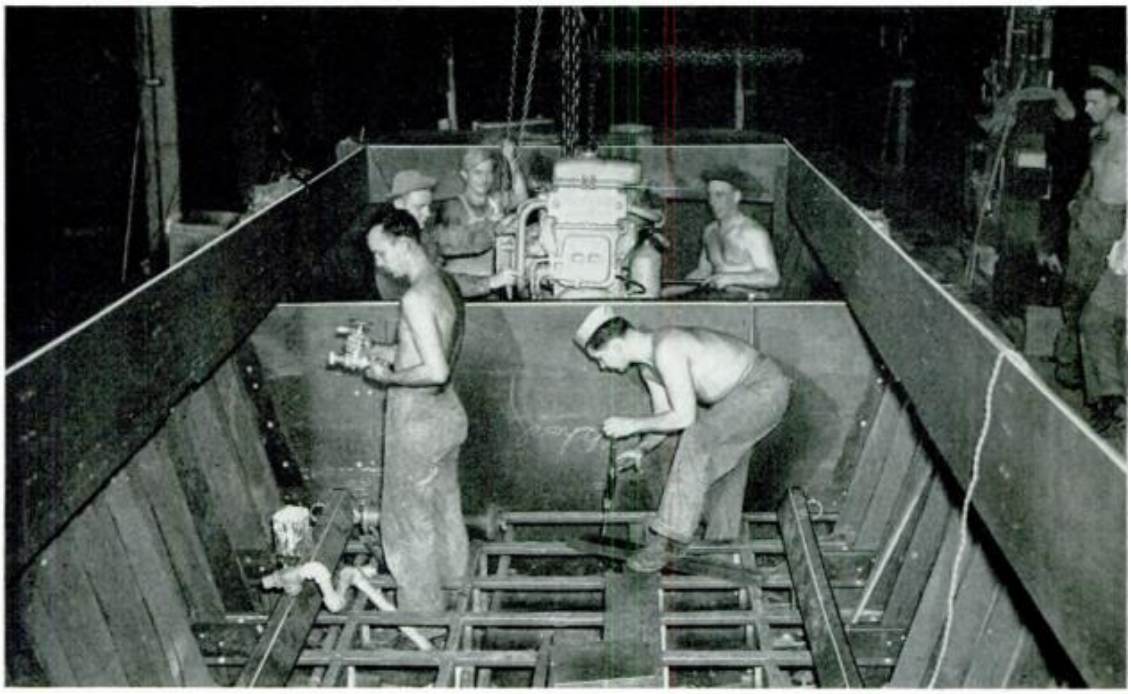
[478] Chief of Engineer, Major General Hugh Casey, *Engineers of the Southwest Pacific 1941-45, Volume IV*: *Amphibian Engineer Operations*, Reports of Operations United States Army Forces in the Far East, Southwest Pacific Area, Army Forces Pacific, 1959, 18 and Heavey, *Down Ramp! The Story of the Army Amphibian Engineers*, (Washington, D.C.: Infantry Journal Press, 1947), 549.

[479] Ibid, 550.

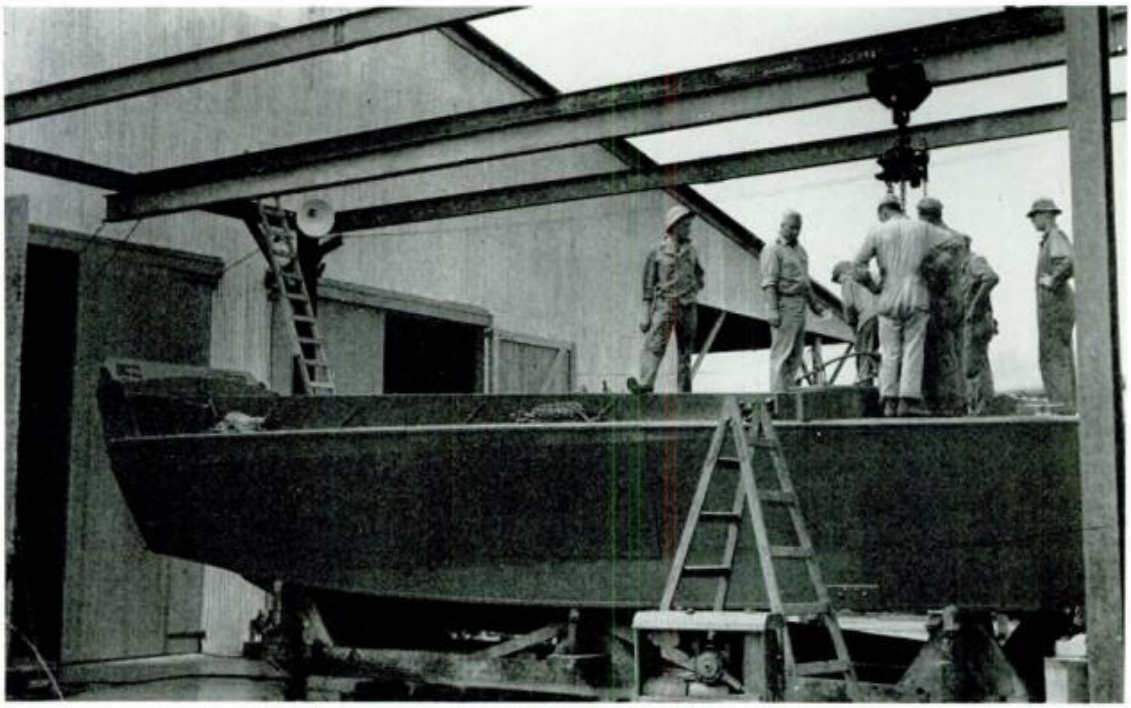
engineers, this began with the assembly of the requisite landing craft or boats in the theater. With naval transports limited in availability and therefore space aboard each, the Navy and Army had to identify an appropriate method by which to transport these implements across the vast lines of supplies from the US to Australia in numbers sufficient to meet Gen. MacArthur's needs. By agreeing to transport these boats in a disassembled state to have the amphibians reassemble them upon arrival in Australia, the US was able to effectively resolve this capacity and operational quandary.[480] To efficiently complete the assembly activities at the Australian end of the movement, the amphibians required what equated to an assembly facility. But to establish this plant, there were no construction engineers available, and again the amphibious engineers had to assume another role. This time of performing construction operations. The amphibians had to develop and construct their craft assembly facility with the suitable location finally determined to be the small port town of Cairns in Queensland, situated on Australia's Eastern coast.[481] Eventually, once established, the 411th Base Shop Battalion of the 2nd Engineer Special Brigade would assemble, on average, seven boats per day.

[480] Chief of Engineer, Major General Hugh Casey, *Engineers of the Southwest Pacific 1941-45, Volume IV*: *Amphibian Engineer Operations*, Reports of Operations United States Army Forces in the Far East, Southwest Pacific Area, Army Forces Pacific, 1959, 43.

[481] Chief of Engineer, Major General Hugh Casey, *Engineers of the Southwest Pacific 1941-45, Volume IV*: *Amphibian Engineer Operations*, Reports of Operations United States Army Forces in the Far East, Southwest Pacific Area, Army Forces Pacific, 1959, 33.



411th Engineers at work assembling an LCVP at Cairns.



Outdoor view of an assembled LCVP leaving the Engineer Boat Assembly Plant.

Figure 8: Photographs of Army amphibious engineers assembling Landing Craft, Vehicle, and Personnel (LCVP) and after assembly at the Cairns assembly plant. Photographs from Chief of Engineer, Major General Hugh Casey, Engineers of the Southwest Pacific 1941-45, Volume IV: Amphibian Engineer Operations, Reports of Operations United States Army Forces in the Far East, Southwest Pacific Area, Army Forces Pacific, 1959, 43.

Boat maintenance, a critical feature of amphibious warfare, provided its unique challenges in the SWPA. To begin with, the most obvious difficulty for the boat maintainers that would persist throughout the war's duration notwithstanding the US industrial dominance, was the shortage of replacement parts and components.[482] In this situation, the reader might attribute to the noted distance of the lines of supply, but that is only part of the equation. The researcher and student must also consider the frustratingly inherent supply bureaucracy that exists in the US Army supply process and relationships. The US Army was the best and relatively most efficiently supplied land force in World War II, the isolated and austere conditions of the SWPA notwithstanding. But the, at times, maddening fragmented process by which replacement and repair parts made their way from debarkation, through the higher echelons, to the maintainers, had an unavoidable, but not crippling impact. In their post-war account of the Engineer Special Brigades, Maj. Gen. Casey's staff attributed this dilemma to the centralization of the repair parts flow combined with the lack of operational foresight in having these parts proportionately disseminated throughout the command to the maintainers in the forward operational areas.[483] To overcome this, the maintenance soldiers, like their peers piloting the landing craft or as part of the shore party entities, improvised to complete their mission. In this instance, to ensure sustained operationality of these precious machines. As Casey's chroniclers noted, this often meant the cannibalization of other landing boats, wrecked beyond repair and, "at times baling wire was literally used."[484] While the role and operations of the Engineer Special Brigades

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[482] Chief of Engineer, Major General Hugh Casey, *Engineers of the Southwest Pacific 1941-45, Volume IV*: *Amphibian Engineer Operations*, Reports of Operations United States Army Forces in the Far East, Southwest Pacific Area, Army Forces Pacific, 1959, 18 and Heavey, *Down Ramp! The Story of the Army Amphibian Engineers*, (Washington, D.C.: Infantry Journal Press, 1947), 718-9.

[483] Ibid.

[484] Ibid.

maintenance activities were more technical than doctrinal in military parlance, its charter rendered them an inherent team member. Thus, technical maintenance had an unmistakable effect on the Engineer Special Brigades and Army task force doctrinal application and, development.

If the incessant shortage of repair parts was not challenging enough, the maintainers simultaneously had to contend with the ever-advancing “line” of operations in the theater. Such a tactical reality is always a logistical and transportation concern in land warfare but in the context of the SWPA where the primary means of movement and transportation was via waterborne vessels, this presented a unique opportunity to overcome. The effort to perform a movement of the maintenance formations, disembark, identify a sufficient operational location, and establish operations was no less than a Herculean undertaking and with some degree of regularity. In the end, and as with the other items on the US Army’s lengthy list of wartime enigmas, the soldiers and officers solved the functional puzzle.

The Historiography of World War II in general has overlooked the critical role of maintenance in contributing to the US and their allies' victory. While the monumental production achievements of America’s wartime industry pundits and academics often laud and cite as the preeminent reason for America’s expeditious rise to worldwide martial and naval dominance by 1945, an overly simplistic and inaccurate summation, this is not the same for the attention afforded to operational upkeep. Yes, American industry in conjunction with the federal government flexed its considerable and enviable muscle, dwarfing Japan, and Germany in terms of the number and to varying degrees, the quality of modern, advanced military munitions and vehicles, these implements required repairs and preventative maintenance. The engineer branch was a component of the Army heavily reliant upon these advanced machines and thereby could

not afford prevalent mechanical issues that prevented their operability. Keeping this equipment mission-ready was an effort equitable in every way to their development and production. That concession warrants a more thorough appreciation and examination in the historiography of World War II. Compounding this concept is the fact that the US Army and Navy had to do so not in a single theater of operations, but in every corner of the globe makes this a topic worthy of extensive research and analysis. The US Army had to perform combat amphibious assaults across the world with limited landing craft and to maintain enough of these vessels in a functional state, perpetually, very nearly defies conceptualization. The maintainers of the Engineer Special Brigades may not have had the most glamorous military job descriptions, but in World War II and the SWPA especially, they were the indispensable men to eventual victory.

The Engineer Special Brigades' operations supporting the US Army's return to the Philippines proved to be their tactical apex and terminus. The ledger of what the amphibians delivered to the two primary Leyte landing sites within the initial six days of the operation demonstrates the scale of only one of the assaults in the return to the archipelago. The 2^{d} Engineer Special Brigade placed ashore approximately 81,000 soldiers and 80,000 tons of supplies to facilitate the decisive operations upon the island.[485] Regarding the Lingayen Gulf landings of January 1945, when or if discussed, historians and authors often compare it with the OVERLORD landings at Normandy, France in June 1944. However, such an association is superficial at best and analysts should offer both as mutually exclusive events, exemplifying the wide variety of operational circumstances under which the Army's amphibians encountered. The fact is that with the Luzon operation, and all the SWPA amphibious landings, these operations the Army performed as ship-to-shore operations, with some exceptions. The Allied return to

[485] Ibid, 487.

Northern France was a shore-to-shore operation that presented its unique challenges at the far side objectives or landing beaches which the Germans defended much more staunchly and effectively than did their Japanese counterparts. That said, a retreat or withdrawal from Normandy at least meant a return to their friendly projection platform, the British Isles. In the vastness of the Pacific, such a safety net, if the recorder may so characterize, did not exist or did so in a significantly diminished context.

History cannot overstate that the contributions of the amphibious engineers were critical to the strategic and tactical success of the US in the SWPA theater. The US in every theater of World War II faced the unenviable reality of having to distribute the full capacity of its land power formations from seaborne craft. Airborne assaults and raids notwithstanding. In many of these situations, these operations were combat actions requiring the landing units to defeat a defending enemy occupying prepared and fortified fighting positions. In the SWPA theater, these combat landings represented not only the Army's most complicated operations but the most treacherous as well. But these missions in the strategic sense also required these new amphibious engineers to follow the initial landings with the delivery of essential supplies and munitions to sustain the effectiveness of the combat formations. In a theater characterized by water and isolated islands, the engineers' doctrinal requirement to "make the way easier for the soldiers' advance" was plausible only through the development and implementation of the Engineer Special Brigades.[486] It was the work of these amphibians that provided how Gen. MacArthur could tangibly achieve the island-hopping methodology that history has correctly lauded him for in defeating Japan in the SWPA.

[486] Mann, *He's in the Engineers Now*, (New York: Robert M. McBride & Company, 1943), 112.

Chapter VIII:

Conclusion

World War II was an unparalleled event in human history, and despite the considerable amount of research work historians have completed on this conflict, there remains much scrutiny for historians to harvest. This fact alone implies that there remains incomplete historical analysis associated with this war. Be it military history in the traditional sense, or the social, economic, and political elements both in a narrow vein or with the intersectionality of all these components, World War II has much more to offer historians. The war against Japan in general, particularly the US Army's function in it, remains an underappreciated field of study. Within that sentiment are the role and contributions of the US Army's preeminent combat enabler, the combat engineers of the Southwest Pacific Area or SWPA in the US attaining the strategic victory over Japan.

Military historians have and continue to analyze and critique the strategic and tactical decisions, plans, and operations of the U.S. Army's Word War II experience both overall and to a lesser degree, in the SWPA. Although Professor John C. McManus specifically has helped fill the gap associated with the latter in his recent trilogy recounting the Army's overall Pacific War experience.[487] But even such prodigious works as McManus' efforts emphasize the strategic and tactical experiences from the combat branches of the Army, such as the infantry and armored formations. McManus does offer snippets of the participation and contributions of other branches and services such as engineers and transportation, but they remain in a supporting role. This work, among other aspirations, aims to demonstrate that because of the scale of this conflict, it

[487] See John C. McManus trilogy consisting of *Fire and Fortitude: The US Army in the Pacific War, 1941-1943* (New York: Caliber, 2019), *Island Infernos: The US Army's Pacific War Odyssey, 1944* (New York: Caliber, 2021, and *To the End of the Earth: The US Army and the Downfall of Japan, 1945* (New York: Caliber, 2023).

required the US Army and its sister services to fight as combined arms and joint service teams. In this specific instance, it is through the wide array of capabilities that the Army's engineers, specifically its combat and amphibious soldiers, brought to the fight. It is not altogether improper for the historian to view them as the Army's multi-tool. That is how combat was plausible both in concept and execution.

It is not the intended goal of this work to elevate the combat engineers to a position of supremacy relative to that of their fellow soldiers and military occupational specialties. It is to simply expand the scope of the historiography of this war and acknowledge the necessity of branches other than the infantry, for example, in the conflict's outcome. A foundational element of this work that demonstrates the critical combat engineer role in the SWPA was the theater's physical characteristics. Unlike the Central Pacific operational theater, which ocean waters dominated, the SWPA while yet a maritime theater, contained landmasses including the Australian content, the immense island of New Guinea, the Philippine Archipelago, and a plethora of smaller, isolated islands deemed strategically relevant.[488] Once President Roosevelt and the Joint Chiefs settled the American command structure of the war with Japan and the corresponding areas of responsibility, it was obvious that the Army would take the lead in the SWPA.[489]

The strategic and tactical levels of war predominated military thinking at the time of World War II.[490] While the link between the tactical and strategic elements is intrinsic to each

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[488] Staff of General Douglas MacArthur. *Reports of General MacArthur: The Campaigns of MacArthur in the Pacific,* vol. 1. (Washington, DC: Office of the Chief of Military History, Department of the Army, 1950), 31.

[489] Louis Morton, *US Army in World War II: The War in the Pacific: Strategy and Command: The First Two Years* (1962; repr., Washington, D.C.: Center of Military History: United States Army, 2000), 252-3.

[490] Carl Von Clausewitz, *On War*, ed. and trans. Michael Howard and Peter Paret (Princeton: Princeton University Press, 1976), 128.

other, it is also proper to note the inherent relationship between the strategic and tactical levels with each Army branch and military occupational specialty. In the case of the SWPA and the larger Pacific War, the United States would not have achieved the strategic victory of 1945 without the tactical exploits on these small and insignificant locales such as Makin Atoll. However, examining war in the broader sense requires the assessor to connect the dots to reach the terminus. Dots that represent the cascading campaigns and associated battles that in the case of SWPA Supreme Commander, General (Gen.) Douglas MacArthur has famously been known in historiography as "island hopping."[491]

The concept of "land war" within the context of the SWPA was, without question, going to require a tactical approach unlike the US Army had ever experienced in its two-century existence. Once the US Joint Chiefs settled the theater-level organizational and command matter it should be obvious to the reader that despite the SWPA being an "Army" area of responsibility owing to the prevalence of land masses, operations in this region would still require maritime activity and support. And that support would comprise a considerable component of the operational or tactical organizations, at all command levels. Thus, this unfamiliar "type" of warfare, for the Army, necessitated an exhaustive evaluation of all Army doctrine. In some respects, there would be no change, in others, slight alterations while in the balance there would need to be significant, if not the development of new doctrinal considerations heretofore nonexistent. For the engineers and combat engineers, this was the reality that the branch faced in the early months of 1942.

[491] Walter R. Borneman, *MacArthur At War: World War II in the Pacific* (New York: Little, Brown and Company, 2016), 262.

Fortunately for the leaders and soldiers of the SWPA combat engineers, Army engineer doctrine at the time of World War II was not rigidly all-encompassing. That is the doctrine of 1941-42 laid out those activities and requisite end-states in explicit terms but left open the way to successful realization.[492] As contemporary chroniclers and post-war historians have noted, a prevalent characteristic of all the engineer units and therefore soldiers, was their ingenuity in resolving irksome situations where Army doctrine either provided no guidance, or the standard or organizational methodology these soldiers could not implement, for any number of reasons.[493] To the post-war, modern reader, this is counterintuitive based upon the conventional view of America's unrivaled industrial domination of the war. While that is an accurate assessment of that aspect of World War II, the student cannot then simply conclude that every formation in every corner of the globe where the US was engaged, had every implement of war necessary available at arm's length and in voluminous supply. The SWPA theater exemplifies that reality by the fact that Gen. MacArthur had to execute operations on a shoestring "budget" owing to this theater's lower position on the national, strategic prioritization list.[494] Resourcefulness was not simply a nice buzzword, but a tactical necessity. This also meant that leadership, the always critical function of operational success, but often overlooked, was a decisive component of the combat engineers' SWPA efforts.

A work such as this presents the elements of the combat engineers SWPA experience in compartmentalized form. Such that doctrine and leadership appear as separate or distinct

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[492] See the Engineers' foundational doctrine as represented by United States Army, *FM 5-5: Engineer Field Manual: Troops and Operations*, (Washington, DC: United States War Department, 1941) and United States Army, *FM 5-5: Engineer Field Manual: Engineer Troops*, (Washington, DC: United States War Department, 1943).

[493] Carl Mann, *He's In the Engineers Now* (New York: Robert M. McBride & Company, 1943), 13-20.

[494] Staff of General Douglas MacArthur. *Reports of General MacArthur: The Campaigns of MacArthur in the Pacific,* vol. 1. (Washington, DC: Office of the Chief of Military History, Department of the Army, 1950), 40-41.

components of the operational record. However, they were holistic in application and that has been and remains true of warfighting to this day. Bringing together the various pieces of tactical combat engineer missions was the dominant function of leadership.[495] As the branch had to effectively adapt first to the technological advancements in munitions and the correlating operational evolutions, it required leaders not simply well versed in the technical and tactical aspects of combat captaincy, but adaptive and forward-thinking in responsibility to their soldiers.[496] This all is easier said than done and filling this necessary leadership void immediately following the war's onset and throughout the duration, was a persistent area of focus and concern for the branches and Army senior leadership.

For starters, the immense scale of this war combined with the evolution of warfare made it necessary to expand the combat engineers' scope of responsibility and number of units.[497] As the volumes within the Army's official histories, commonly known as the "green books," note, the process of wholescale expansion created a leadership gap that required a change in how the branch had traditionally obtained its influx of junior or new leaders.[498] Considered against the backdrop of having to assess current combat engineer doctrine while simultaneously capturing the lessons learned in the US's first combat forays is in and of itself a remarkable achievement. An achievement that in its own merits warrants further study and in detail, not only concerning

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[495] United States Army, "Chapter 3: Leadership," In *FM 100-5: Field Service Regulations: Operations*, (Washington, DC: United States War Department, 1941).

[496] Blanche D. Coll, Jean E. Keith, and Herbert H. Rosenthal, *The United States Army in World War II: The Technical Services: The Corps of Engineers: Troops and Equipment*, (1958; repr. Washington, D.C.: Center of Military History, The United States Army, 2002), 146.

[497] Karl C. Dod, *United States Army in World War II: The Technical Services: The Corps of Engineers: The War Against Japan*, (1966, repr., Washington, D.C.: Center of Military History, United States Army, 1987), 271-2.

[498] Coll, Keith, and Rosenthal, *The United States Army in World War II: The Technical Services: The Corps of Engineers: Troops and Equipment*, (1958; repr. Washington, D.C.: Center of Military History, The United States Army, 2002), 3.

the engineers but the Army as a whole. The expansion of the leader, officer specifically, identification and preparation to include the Army's Officer Candidate School or OCS beyond that of the United States Military Academy at West Point was necessary to meet the manpower and leadership deficit. But as Blanche D. Coll, Jean E. Keith, Hebert H. Rosenthal, and other historians noted, the expansive scope of engineer responsibilities and associated technical characteristics was restrictive as it relates to which soldiers, officer candidates, and cadets would be appropriate engineer officers and leaders.[499]

Heightened in this process between the intersection of leadership and doctrinal development is considering the new role of performing amphibious operations. Once receiving this task from the Army's supreme leadership, the branch had to formulate a requisite and functional doctrine. As Brigadier General (Brig. Gen.) William Heavey recounted following the war, this was heretofore, an altogether new operational concept, at least for the US Army.[500] Before the war, or even the prognostication that the US might eventually be a combatant in the closing years of the 1930s, amphibious assaults from an operational perspective US strategic leaders and planners viewed as the prerogative of the US Navy and Marines Corps.[501] Faced with the reality of war throughout the Pacific and sizable portions of the Asian continent, the tactical requirement made it impossible for the Navy and Marines to remain the sole proprietor of such missions. The common view of these operations being small in scale and isolated, senior leaders quickly discarded with the descent of cold reality. Likewise, the Army's long-held operational

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[499] Ibid, 148-9.

[500] Brigadier General William F. Heavey, *Down Ramp! The Story of the Army Amphibian Engineers* (Washington, D.C.: Infantry Journal Press, 1947), 1.

[501] Office of the Chief of Engineer, Major General Hugh Casey, *Engineers of the Southwest Pacific 1941-45, Volume IV*: *Amphibian Engineer Operations*, Reports of Operations United States Army Forces in the Far East, Southwest Pacific Area, Army Forces Pacific, 1959, 10.

supposition that it would disembark its deployed formations onto its landmass area of operations via established, built-up ports also became a concept devoid of merit, at least within the context of the SWPA's topography. Whereas the breakneck pace of expansion placed a cumbersome burden upon the engineers' newly minted officers and non-commissioned officers to adequately train their "green" recruits and draftees, both individually and as members of the team or unit, this represented a steeper grade to ascend for the amphibious engineer leaders.

While this amphibious role was uncharted territory for the engineers in form and fashion, when the examiner surveys the fundamental, doctrinal responsibility of the engineers to facilitate maneuver and mobility, it aligns with their operational charter. Historiography has and continues to view the Pacific War as one decided, at least strategically, in the air.[502] Yes, the advancement of combat aircraft during the interwar period the researcher might appropriately claim as being the most robust and significant. But the reality is that war in general and specifically concerning the war with Japan, still required placing men on identified islands or continents to close with, engage, and defeat that enemy in combat to achieve the stated end state or victory. The airplane became a critical element of the combined arms and joint service team, but it represented that, one element. Examination of the Army's operational objectives and associated plans for many, if not most, of the SWPA amphibious operations contain seizure of existing Japanese airfields or topography most often identified by the engineers as being the most promising for the establishment of a new airfield. Advancing the fighter or bomber line became a common theme with the soldiers of all ranks within the SWPA.[503] MacArthur had naval support within his area

[502] Robert Ross Smith, *U.S. Army in World War II: The War in the Pacific: Triumph in the Philippines*, (1963, repr., Washington, D.C.: Center of Military History, United States Army, 2005), 4-5.

[503] Staff of General Douglas MacArthur. *Reports of General MacArthur: The Campaigns of MacArthur in the Pacific,* vol. 1. (Washington, DC: Office of the Chief of Military History, Department of the Army, 1950), 100.

of responsibility, but that did not include the Navy's new ultimate power projection platform, the fleet carrier. For his operational commanders to secure the necessary aerial superiority, locally at the tactical level, required this sequential advancement up the islands of the SWPA, better known to history as the island-hopping approach. A term and characterization that MacArthur was not fond of.[504]

Mobility and maneuverability as the 1941 edition of the *Engineer Field Manual (FM) 5-5, Troops and Operations* dictated was one of three foundational engineer operational tenets.[505] Thus, all other engineer doctrine, leadership development, and soldier training explicitly and implicitly correlated to this principle alongside the others. For the combat and amphibious engineer soldiers and units then posted to the SWPA had to customize their operations accordingly. Hence the introduction of amphibious operations, as another combat operational element, to the emergence of joint and combined operations to MacArthur's strategic vision. Historians such as Kevin Holzimmer have examined in some depth the development of joint and combined operations as a matter of necessity in prosecuting the war against Japan.[506] However, that analysis does not direct much light on the role and contributions of the combat engineers. Researchers continue to center their analysis of engineer work upon the technical, construction role of the service engineers who constructed base camps and airfields, most notably. But that narrow engineer focus overlooks and eventually omits the mandatory operational tasks of first maneuvering the combat, service, and supply formations to their respective landing sites or beaches, and the efforts of the combat engineers once ashore.

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[504] Ibid.

[505] United States Army, *FM 5-5: Engineer Field Manual: Troops and Operations*, (Washington, DC: United States War Department, 1941), 1.

[506] Kevin C. Holzimmer, "Joint Operations in the Southwest Pacific, 1943-1945," *Joint Force Quarterly: JFQ*, no. 38 (Third Quarter, 2005), 102-3.

At least from the perspective of the Army and those historians who have scrutinized the service's World War II experiences, the SWPA offers a unique tactical vignette. It was an experience very much unlike anything else the Army experienced in its other theaters of operations between 1942-45. In that sense, it has been and continues to be then a challenge to qualify that operational experience, relative to those other venues. For one, whereas the Western armies had universally experienced significant technological advances in munitions between the world wars, and Japan did too, the physical nature and therefore realities of this austere and under-developed region either limited the scale of application of these munitions or prevented their utilization outright. Combat in the SWPA between the US, their Australian allies, and the Japanese a small unit, again relative to Europe for example, close-order, and over rugged, austere topography. The combat engineers intently focused on the principle of ensuring mobility to the emerging implication of wheeled and tracked vehicles as an instrument of war in the period preceding the war and the forbidding nature of the SWPA necessitated an about-face technologically, but not doctrinally.[507] The engineers' charter remained the same. To allow for the combat formations, the Army's decisive element, to move to the enemy, attain a favorable position relative to that enemy, and finally defeat that enemy in combat.

Fighting in New Guinea and the islands targeted during the overarching CARTWHEEL operation exemplify the multiplicity of the combat engineers and typify, at least specifically at these locations and in this period, these soldiers' frontline, and at times, direct combat engagement. Primarily an infantry war, the combat engineers used their most basic and rudimentary tools to facilitate the ability of the former to maneuver over and through dense

[507] Coll, Keith, and Rosenthal, "The Impact of the German Blitzkrieg." In *The United States Army in World War II: The Technical Services: The Corps of Engineers: Troops and Equipment*, (1958; repr. Washington, D.C.: Center of Military History, The United States Army, 2002) 18-22.

jungle terrain. The engineers cleared foliage to allow for foot and less vehicular traffic as part of the tactical operation. The mobility and maneuverability aspect consisted of more than creating a way forward such as foot trails but also removing or destroying enemy-constructed and emplaced obstacles intended to influence or impede US Army units' ability to maneuver. Brig. Gen. Jens Doe, an officer who fought in the SWPA as a member of the US 41st Infantry Division penned an article outlining his thoughts and recommendations on conducting combat operations in a jungle environment.[508]

For this work, the most pertinent supposition made is that in such a setting the necessity for the full spectrum operations elevated the need for engineer capabilities. Doe is correct to note that the principles of war equally apply to the jungle and operations conducted in more "favorable" geography.[509] This demonstrates the scientific aspect of warfare and that there are universal principles that the practitioner must observe outside of time and place. More narrowly, it implies that each branch or service of an army, in this case the US Army of the SWPA and the combat engineers had to perform their fundamental doctrinal activities by tailoring them to the physical realities where they found themselves. Beyond this need to assure mobility of artillery and infantry formations, circumstances in the SWPA often required the engineers, combat and amphibious especially, to perform their ancillary doctrinal role of direct combat.

Because MacArthur's SWPA was down the prioritization list related to the other operational areas and combined with these often-stark geographic realities, he persistently lacked the number of combat units, especially infantry, that he thought necessary to conduct combat

[508] Brigadier General Jens A. Doe, "Notes on Jungle Warfare," *Military Review* XXIII, no. 10 (January 1944), 5-9.

[509] Ibid, 5.

operations against the Japanese.[510] This reality was especially stark throughout 1942 and as a result, engineer soldiers often found themselves filling the tactical gap in this regard. This proved true not only for the combat engineers but the Service or Construction soldiers who often found themselves performing in such a role by defending airfields against enemy attacks.[511] Often these were airfields that these construction engineers had earlier developed or repaired. Transitioning between the technical and combat roles was more common and less burdensome for the combat engineers as their classification as a "combat" engineer implied this function. Yet, that being true, for the combat engineer leader it placed upon this person the responsibility for ensuring that each soldier and collective unit was, if not proficient, at least serviceable in both areas. Army officers and non-commissioned officers often believe that their formations are not fully prepared for the harsh realities of combat. To meet the Army's operational need in fighting this war, the engineers established supplemental training sites beyond the branch's home of Fort Belvoir in Virginia.[512] Further reflecting the leaders' obsession with always requiring additional training, the Army established within the SWPA supplemental training sites where commanders could further meet this perceived need.[513]

To be fair, not all this training was frivolous. The introduction of the amphibious assault operation and the amphibious engineers, in some ways cobbled together, required adequate

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[510] Staff of General Douglas MacArthur. *Reports of General MacArthur: The Campaigns of MacArthur in the Pacific,* vol. 1. (Washington, DC: Office of the Chief of Military History, Department of the Army, 1950), 42.

[511] Dod, *United States Army in World War II: The Technical Services: The Corps of Engineers: The War Against Japan*, (1966, repr., Washington, D.C.: Center of Military History, United States Army, 1987), 175-8.

[512] Coll, Keith, and Rosenthal, "The Impact of the German Blitzkrieg." In *The United States Army in World War II: The Technical Services: The Corps of Engineers: Troops and Equipment*, (1958; repr. Washington, D.C.: Center of Military History, The United States Army, 2002), 158.

[513] Dod, *United States Army in World War II: The Technical Services: The Corps of Engineers: The War Against Japan*, (1966, repr., Washington, D.C.: Center of Military History, United States Army, 1987), 383.

preparation, something that simply was not available or even plausible at home in the US The enemy and natural tempo of war do not wait for each combatant to adequately prepare before they can pursue necessary operations. This certainly was the case with the amphibious engineers of the SWPA. For MacArthur, it was a challenge to obtain the services of these units and their landing craft. Once firmly in his chain of command, he could address the training gap. Fortunately for the US Army, their Australian partners had some operational experience with this concept and were able to facilitate the training of their US counterparts, especially in the early months of the war.[514] Similarly, despite the operational burden placed upon the US Navy that prevented their "normal" role in this element, naval personnel were available to prepare the Amphibians' boat crews for their new role as maritime soldiers. This fact not only had the obvious tactical impact, but strategic implications as well. If the Army of the SWPA could not maneuver themselves from ship or shore to objective shore (beach), the intended decisive land operations would be invalid.

The overarching element of the Army's and more narrowly the engineers' SWPA experience was doctrinal evolution. The reality is that a thorough and deliberate contemplation of the doctrine concerning engineer activities both directly and indirectly experienced incremental adaptation during the war. That reality is attributable to the fact that US Army doctrine was not, nor intended to be, objective and detailed "how to" instruction manuals. The doctrine provided the basis for what a branch or service must accomplish within the broader context of the US Army's wartime mission. For the reader or historian devoid of military experience, they might think of doctrine, in the guise of field manuals, as a dictionary. Oversimplified, doctrine provided the Army's practitioners with the definitions of their trade, but it was the planners, leaders, and

[514] Unknown, "Chapter III: In Sunny Queensland," In *History of the Second Engineer Special Brigade: United States Army, World War II* (Harrisburg, PA: The Telegraph Press, 1946).

soldiers' responsibility to apply the doctrine in a form sufficient to the circumstances at hand. While this summation is applicable in totality, the degree of doctrinal evolution varied among the Army's various branches and services. It is easy for historians to characterize as new the doctrine associated with amphibious engineers. Of course, new was relative as the Army did incorporate much of the pre-war work done by the US Navy and Marines Corps into their doctrine avoiding therefore the compilation from scratch.[515]

Furthermore, the readers must account for the fact that because World War II was truly a war fought in every corner of the globe, extrapolating a tactical lesson learned by combat engineers in the Netherlands was not universally applicable to Army engineers serving with Lieutenant General (Lt. Gen.) Joe Stilwell in China and Burma. The fundamentals quite naturally were ascribable to all Army engineers regardless of place and time, but leaders and soldiers, not to mention planners, had to account for the peculiarities of their situation. Thus, while the researcher can point to doctrinal lessons gleaned by the combat engineers of the SWPA, these same scholars cannot then conclude that the experiences of these soldiers irreversibly holistically affected doctrine and pragmatically, to their fellow engineers conducting operations in other regions.

The combat engineers assigned to duty in the SWPA also performed their doctrinal responsibility for ensuring the mobility of the combat formations by repairing or placing new bridging allowing the latter to overcome such obstacles and close with the Japanese enemy. The capability to overcome wet or dry crossings has been a military commander's concern for centuries. Conversely, such natural obstructions have served commanders in defense well by restricting their enemy's (attacking) freedom of maneuver or in some instances, requiring the

[515] Colonel Arthur G. Trudeau, "The Engineer Amphibian Command," *Military Review* XXIII, no. 6 (September 1943), 19-24.

latter to forgo the offensive altogether. Of course, the doctrinal task of mobility includes that of counter-mobility as well meaning that the combat engineers while providing US and friendlies the freedom to maneuver, unhindered throughout the battle space, likewise had to impede the Japanese maneuverability throughout that same space, were they so inclined. The rudimentary realities of the SWPA required the engineers to hastily build bridges be they foot or vehicular bridges. For the greater portion of the conflict, bridging, while still important, was not a persistent tactical matter to overcome. In fact, outside of New Guinea and the Philippines, wet gaps or river crossings were few or very non-existent on the islands upon which MacArthur conducted the preponderance of his missions.

The student and researcher need to consider that the critical nature of bridges, regardless of their construction or type was not solely to place the infantry or armored formations on the far or objective side of the given crossing. It was just as important to sustain the combat power of said formations on the enemy side by allowing for the rapid and consistent movement of supplies. As the decisive elements such as the combat arms units continued their tactical advances, to retain the initiative and sustain the operational tempo, these soldiers, their vehicles, and munitions required consistent supply support. High morale and strong unit cohesion could sustain the strongest of soldiers and units for only so long. An army requires continually more food, ammunition, repair or replacement parts for vehicles and weapons, uniforms, and an extensive list of other items to effectively wage war. Bridging materials or components, the former being construction supplies to repair existing civilian structures or construct from the ground up “semi-permanent” structures and the latter exemplified by temporary, prefabricated bridge sections that the engineers quickly placed and then removed for subsequent use, like the Amphibians landing craft, were perpetually in short supply.

Bridging considerations on behalf of the combat engineers were most prominent during the re-conquest of the Philippine Archipelago. On the principal island of Luzon, the tactical race from Lingayen Gulf towards Manila demonstrated the operational significance of tactical bridging. The Japanese attempted to destroy as many of the existing bridges along the principal North-South routes throughout Western Luzon. The Sixth and Eighth Army combat engineer Bridgers performed remarkable feats of military engineering by completing this charge in the absence of sufficient numbers of both temporary bridging components and material to repair pre-existing but damaged civilian bridges. This campaign, buttressed by the engineers' contributions, highlights the combined arms nature of MacArthur's campaigns not only at its zenith in the Philippines but throughout SWPA operations.

Action on Luzon was the largest operation conducted by MacArthur's charges during the war. Within this campaign was the battle for control of Manila, the Philippine capital city. Combat operations in Manilla represent the one true instance of urban fighting for the US Army in the SWPA and required a tactical shift by the officers and soldiers engaged in the effort to extricate and defeat the Japanese occupying it. The student may conclude that this presented a unique puzzle for the US Army in the spring of 1945, at least for those soldiers and units that had been conducting operations throughout the balance of the SWPA theater. After three years of jungle warfare to now must apply their tactical prowess in an altogether different combat environment in the minds of some must provide some hesitancy. For the combat engineers, the requirements remained the same although they now had responsibility for enabling mobility for the Army's tanks in the confining nature of combat in a built-up, municipal setting.[516] They also

[516] Dod, *United States Army in World War II: The Technical Services: The Corps of Engineers: The War Against Japan*, (1966, repr., Washington, D.C.: Center of Military History, United States Army, 1987), 617.

had to execute and support river crossings while under fire from the Japanese enemy in support of infantry units responsible for securing the river crossing's far side.[517] Again, the combined arms team demonstrated its role in strategic victory and the indispensable need of the engineers as a component of that tactical structure.

The combined arms team was the engine that drove MacArthur's operations during the war. The introduction of the amphibious or Special Engineer Brigades exemplifies this. War by the period of World War II was a complex human activity born out of contemporaneous technologies and advanced professional processes. Therefore, while the US Army in the SWPA may not have had much opportunity to make use of the advanced tools of war, the processes as represented by the development of maximizing the combat power available to the respective commanders remained untouched by the natural world. While some historians have touched upon the aspect of joint and combined arms on the part of the US military and naval services in the war with Japan, in truth this topic remains ripe for exhaustive examination. Researchers of the war against Germany have more fully developed work associated with this topic, but often more as a basis for understanding contemporaneous US doctrinal warfighting for the officers of the armed forces as professional development. As a historical narrative and exhaustive study, there remains a void.

The war between the US Army and Japan in the SWPA remains an unexamined enterprise in comparison to the other theaters of World War II. Its position in the war's historiography remains a point of debate as to how the US structured and executed it. In retrospect that debate is a moot point as the reality is that the tactical contributions of the US Army under Gen. MacArthur in this theater did help lead to the strategic victory. The balance of the research work

[517] Smith, *U.S. Army in World War II: The War in the Pacific: Triumph in the Philippines*, (1963, repr., Washington, D.C.: Center of Military History, United States Army, 2005), 259.

that historians have completed on this aspect of World War II continues to focus on the person of Gen. MacArthur or the combat arms, primarily that of the US Army's infantry formations found in this theater. This overlooks the tangible and indispensable contributions of the service's other branches, specifically that of the engineers. The physical realities of the South Pacific rendered this theater more apt to the need for exhaustive military engineering more so than any of the Army's other operational areas. This combined with the fact that the SWPA was at or near the bottom of the Army's priority for every element of perpetuating the war served to exasperate the engineers' importance. Looking more closely at the engineers' role and contributions to the war, what analytical focus that researchers have bestowed upon the branch has been the activities of construction engineers, especially with the construction or repair of airfields. The result has been to omit the combat and amphibious engineers in this victory.

The combat engineers contributed to this achievement in many ways, which as their doctrine demonstrated was inherent to their structure and Army expectations. This multiplicity contributes to historians having overlooked them in historiography as their contributions are more difficult to qualify. By examining the SWPA combat engineers through their doctrinal responsibilities, position within the joint and combined arms tactical organization, and indispensable need for leadership to produce tangible tactical results, the extraordinary record of the Army's combat and amphibious engineers' posterity can better appreciate their place within the US Army's forgotten war with Japan.

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